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Editorial

BILLIONS OF DOLLARS DONATED TO PHILANTHROPY IN THE YEAR 1928.

MEDICAL PROFESSION SHOULD *EDUCATE PHILANTHROPICALLY* INCLINED LAYMEN AS TO THE BEST WAY TO DISTRIBUTE WEALTH ALONG THE WAYS OF MEDICAL CHARITY

Donations to philanthropy during the year 1928 ran into billions according to a compilation published in the *Literary Digest*.

In recent years philanthropists have multiplied in number, so, consequently have endowed institutions, intended to be of vast public service by their founders, men of great wealth who have wished to disburse their holdings in the ways of beneficence, but in many instances these disbursements and the institutions they maintain have defeated their own ends, through an improper perspective upon the conditions affected.

Of such nature are endowed institutions and those supported by public taxation that enter into competition with recognized and ethical medical practice, since by virtue of its inherent freedom from any financial burden, such competition must necessarily be both unfair and detrimental. Unfair because the ethical medical profession and its practitioners are not endowed and such endowed and expense-free competition lays a double economic burden upon the medical profession. Detrimental because the rapid increase of such philanthropy must act as a deterrent upon the resupply of the medical profession for the next generation.

How to make use of endowments offered for public medical service so that these endowments shall live up to the intents of the donors by improving medical service and extending its quantity and quality and at the same time function so as not to effect deterioration upon mem-

bers of the ethical medical profession has engendered a great perplexity in medical circles. Much deliberation must ensue before the method is arrived at as how to distribute to the best advantage billions of dollars offered for medical endowment. The problem must be solved by the medical profession, and while it is a difficult problem, it is not impossible.

From doctors in an organized capacity, suggestions should be given to the philanthropically inclined among the country's men and women of wealth, as to the most efficient ways in which to distribute wealth along the ways of medical charity.

For the keynote of success in this direction lies in the immediate and thorough education of philanthropists as to the actual situation in the practice of medicine, taking into account all ethical, moral, scientific and economic angles. Only by this process of education and elimination can the necessary result be achieved.

Unfortunately one of the weeds in the banner crop of altruistic intentions towards one's fellowmen lies in the gigantic growth of socialistic ideas and ideals, springing from the tremendously augmented sums of money devoted to social service enterprises and the consequent introduction, necessary from a standpoint of efficiency, of salaried social workers. Unless some check is made to this tendency, the whole scheme of capitalistic philanthropy will be "hoist by its own petard" and like the man with the seven devils the last state of the house will be worse than the first. Unless checked without delay, the country will find itself with almost surprising suddenness, well on the way to an ultimate social state, involving the destruction of those fundamental principles that have made the United States the outstanding democracy of civilization, and the advance of medical science in that democracy one of the salient factors in world progress. Viewed in the light of this unexaggerated prospect, if socialistic ideas are allowed to run riot, then instead of a beneficence, philanthropy on the loose may well be considered a national menace.

Nor will the fault lie with the philanthropists. They are probably doing the best they can with their money in the light of their limited knowledge of medical ethics and medical economics.

The trite old story of the newly made rich man who wandered into an epicurean hotel and wildly ordered "Ten thousand dollars worth of ham and eggs," because he knew of no other delicacy, nor of any other way to spend some of his millions, is applicable to the philanthropist who donates his wealth to what he thinks is the highest type of human service. With the knowledge at his command the philanthropist is doing the very best he can. Instead of criticism what he needs is enlightenment. The hour is here and it is speeding by for the organized medical profession to step out, as an organization and inform citizens with wealth to distribute and the itch for such distribution, exactly how the money can be turned into the coffers of medical philanthropy so as to insure the greatest good to the public and the continuance of this same medical expertness in the United States that is the envy of every well informed statistician and scientist anywhere in the world. The problem is not one to be solved over night. It is even more than the tariff and the prohibition question, a problem of direct import to every citizen in the United States, and because of American leadership to every citizen in the world.

PAY THE MIDDLE-CLASS ITS JUST WAGES AND THE MIDDLE-CLASS WILL PAY ITS BILLS

Let Big Business Take a Just Percentage of the Profits the Middle-Class Earns Day by Day For Big Business and Put These Profits Into the Pay Envelopes of the Middle-Class Rather Than Into Huge Philanthropic Machines That After All Are Only Vain Monuments to the Men Who Back Big Business

The Ruling Passion Strong In Charity

A Good Business Head Has to Barter With Profit For Its Own Pocket-Book Even When Seemingly Altruistically Inclined

To Buy a Golden Cushion For a Broken Ankle Instead of Trying to Cure the Break Appears Fallacious

Anybody who tries to break himself of an ingrained habit ponders perforce on the sentiment of Lord Byron's famous "Prisoner of Chillon", —"My very chains and I grow friends." Some habits and traits are so unbroken an heritage

in many families that their presence is accepted with the same degree of tolerance as that with which communities at large condone or rejoice in either unpleasant or charming racial traits. This too, in the face of the fact that such inclinations often wreak havoc on the community itself.

Tendencies to dissipation, thieving, immorality or on the other hand, bravery, integrity and highmindedness, become in certain groups as pronounced indices as the white skin of the Caucasian, the blunt nose of the Ethiopian, or the Mongolian attitude towards worry. These trends include the shrewdness of the keen merchant or "big business" man; the charity of the religious, the honor of the medical profession and the courage of the good soldier, all of which work to make this world a better place to live in.

Quite in line with the shrewdness and self-exploitation that have made "Big Business" what it is comes the plainly apparent desire of this occupational group to hide its structural defects and excuse its inherent predatoriness by the simple expedient of following the exhortation of trying to "Assume a virtue if thou hast it not."

In other words, Big Business having glutted itself into prosperity at the expense of that most pitiable sector of civilization, the white-collar or middle-class, shrinks at taking the gaff for its misdeeds in this direction. Instead of the reparation due the middle class, a reparation that would put these modern peons of industry on their merited level of adequate wage compensation, Big Business side-steps the issue and proffers as a substitute a semi-sugar coated form of charity. It is to be noted that this so-called reparation does not take the form of a year's supply of stylish hats, shoes, seal skin coats, roadsters, oriental rugs or grade-A milk to the middle class and its families but is to be doled out at the expense of another class of workers, the medical profession. No matter where you find Big Business on the job, Big Business is always on its elemental job of making the other fellow stand the loss and of making a profit out of somebody. Right there is to be found the keynote of all this medical charity nonsense by which Big Business is trying to hide its own cloven hoof, or to soothe an awakened conscience.

Big Business has become suddenly very much worried over the fact that some of its "small-salaried but valuable men" can't afford to pay for that illness that on occasion is inevitable to all humanity and for which the most expensive care is now available to the very rich because they can afford to pay for expert service and for the very poor because they do not have to pay for it, since expert care for the poor is now paid for by the very rich in order to maintain a mammoth philanthropic bureaucracy that gives to the vanity of the very rich almost as much kick as the nervous system gets out of a shot of moonshine gin. All very wonderful in its way, and about as beneficial. All this running around Robin Hood's barn to "do something about the troubles of the poor dear middle class" *instead of instituting such conditions as would ultimately make the poverty of this middle class a thing of the past by gradual absorption into the ranks of the adequately financed.*

In other words, why not raise the salary of the middle-class? Why not give this class a chance to keep its self-respect, spend its own money, and pay its own bills, instead of keeping its nose to the grindstone to earn more money for the other man to spend as he wishes? Here is a side of the question that Big Business has never been able to see. Having built up a machine that takes away the earnings of another class the limited perspective of Big Business permits it to see no way out but to build up another machine to spend these earnings. The joker in the situation, that ultimately will have Big Business hoist by its own petard, is that Big Business, inherently the bitter enemy of socialization is right now laying the foundation of the socialization and undoing of the world's most permanent and successful democracy. It is very hard for a tyrant to let loose his reins of power. History has shown that when tyrants hold too long and pull too strong, the reins snap and the tyrant gets a hard fall head over heels. It will be a lasting crime against humanity if the grasping vanity of a predatory group is permitted to undo what millions of men and women have suffered, fought and died to uphold.

All the millions that Big Business gives in charity or civic uplift have not come from the inorganic things of earth but from the exploitation of these inorganic things and elements

through the human element—a human element that for the most part has been paid in husks for the winnowing of the grain. And to try to make reparation by handing out a silken cushion to sit in while the chaff chokes the throat and sticks in the nostrils is about the ultimate word in assininity. If a man breaks an ankle, he needs that ankle set and cared for so that it will ultimately be once again well and strong. What he decidedly does not need is a cushion of gold on which to place his broken ankle while he looks at the break and the man who owns the cushion bought with profits on the labor of the man with the broken ankle, stands around and says exultantly, "Too bad, old man, you've been hurt so badly. Never mind. Look at the solid gold cushion you can have to rest it on. That's MY cushion." No, what that man wants is his own good foot, not the other fellow's fine cushion.

The foot will never be well under those circumstances; nor will the "troubles" of the middle class ever achieve even palliation until remedial measures that are actually remedial are applied. Big Business must put into its pocket, all its vanity, its parsimony, its deep-seated love of money, and passion for material gain that in accurate analysis stands revealed as the motivating element of the art of trade and commerce, and come out into the open, with its worship of a sharp bargain laid aside. Life is not a horse trade. Big Business can no longer be conducted on the basis of Indian barter. Men of the same race cannot with impunity buy rare furs for a handful of beads, when dealing with each other. If the truth be known the gist of all this wonderful newly proposed medical charity is not generosity towards any class, but an expansion of trade in the direction of another. Instead of giving the middle class free medical care, Big Business is out to see that this free medical care is scientifically milked out of the medical profession. Not reciprocity but even higher taxation and from new and hitherto undrained fields is what Big Business is about to get.

The medical profession is about to be a commodity of Big Business. This will be a certain result if the philanthropic machine succeeds. Already annually the medical profession as a group donates to charity over forty per cent. of its legitimate earnings.

No small part of this donation goes to families of the middle class, who though the service for these families is not on a basis of out-and-out charity at the same time it should be so designated as these inadequatedly paid, and hence inadequately nourished people, either fail to pay their bills at all, or take so much time at the task that there ensues a loss of interest and money use, that while a doctor never pays any attention to it at all would drive any business man to despair.

If the doctor or the economist is asked for his ideas as to what should be done about medical charity or any other charity for the "Middle-class" the answer if true would be terse. For what is the answer? Simply for Big Business to take a just percentage of the profits the middle-class earns day by day for Big Business and put these profits into the pay envelopes of the middle-class rather than into huge philanthropic or educational machines that after all are vast monuments to the vanity of the men who back big business.

Pay the middle-class its just wages and the middle-class will pay its bills.

SEVEN YEARS OF ACCIDENTS KILL MORE AND MORE

Dr. Andy Hall, Director of Public Health, State of Illinois, says:

Seven years of peace have killed more Illinoisans than the world war did.

Three times as many males are killed as females. Man is man's enemy.

"Accidental deaths in Illinois," Dr. Hall said, "have jumped from 4,803 in 1922 to 5,950 in 1928, a rise of nearly 24 per cent. The total dead from accidents for the period is 38,532.

"Bad as it is, the automobile is responsible for less than one-half of all accidental deaths. Accidental falls caused 961 deaths; railroad accidents, 662; burns, 416; drownings, 383; breathing poisonous gas, 241; eating poisonous food or medicine, 131. These and various other miscellaneous mishaps pile up the startling total of 4,205 accidental deaths, against 1,745 charged against the automobile directly.

"Males get the worst end of the bargain all the way through where violent deaths from any

reason are concerned. Accidents killed 4,359 males against 1,468 females.

"Suicide is almost altogether a masculine means of demise. Last year in Illinois 953 men and boys took their own lives, while only 174 females committed suicide.

"With murder the situation is almost the same. Out of 783 persons who died through the homicidal action of fellow beings, 652 were male and only 131 female. Of the total 504 occurred in Chicago.

"Accidents occur because people are out of tune with their environment. A surprisingly large number of children are killed in their homes because poisonous drugs are left within their reach. Indeed, accidental poisoning, burning, falling, firing of guns and pistols, drowning and coming into contact with machines, cause more deaths among children less than 15 years old than do auto mishaps. Nearly all of these accidents, except the drownings, occur in homes.

"Any significant advancement toward accident prevention will depend very largely upon a better adjustment of man to his environment. This will include not only more rigid traffic regulations and more refined traffic courtesy but a far more acute mental alertness in respect to potential accidents in the home and workshop."

GEORGIA HAS CREATED A PERMANENT HISTORIAN FOR THE STATE MEDICAL SOCIETY

This Is the Proper Perspective on Preservation of Medical Annals

Georgia has created a permanent historian for the state medical society. This is a marked step forward. The happenings and professional events of importance will be recorded each year; details of these events will be fresh in the memory of the historian and can be accurately set down without loss of color; the report of the historian can be recorded annually in the archives and this report can also be presented at the annual meeting of the state society for discussion and approval, just as is done with reports from other committee. At intervals of ten years or at other stated times these reports can be taken out and put into volume form for convenience.

History is the record of today's details and as life is history in the making, so history is life that has been made. Down in Georgia the Medical Association of the state has the right idea about the necessity of recognizing the importance of history.

Upon the recommendation of Dr. Frank Boland, Dr. E. C. Thrash, chairman of the subcommittee appointed by the general committee to compile a medical history for the medical association of Georgia, states, a department of archives of Medical History of Georgia has been established and Dr. J. C. Weaver has been appointed historian. The advantage of having a permanent department of this nature in charge of a permanent appointee is far too obvious to call for further comment. Any one who has ever attempted to compile, collect or obtain data subsequent to the immediate moment of an occurrence, realizes what the department will mean to the medical profession of the state. Detailed comment upon the action appeared in the *Journal of the Medical Association of Georgia,* under date of August, 1929.

ADAMS COUNTY SOCIETY BIG ALL-DAY MEDICAL MEETING

Quincy, Illinois

Monday, October 14, 1929

The 4th Annual All-Day Fall Clinical Meeting of the Adams County Medical Society will be held at Quincy, Illinois on Monday, October 14. This meeting is one of the largest one-day programs of any county medical society in the Middle West. The speakers who have been secured are sure to attract a big attendance. The program is an all-Philadelphia one and will be given by the faculties of the University of Pennsylvania School of Medicine and the Graduate School of Medicine of the University of Pennsylvania.

Among those who will give papers or clinics are:

E. L. Eliason, M.D., F.A.C.S., Prof. of Clinical Surgery.

E. B. Piper, M.D., F.A.C.S., Prof. of Obstetrics.

Gabriel Tucker, M.D., Asst. Prof. of Bronchoscopy and Esophagoscopy.

I. S. Ravdin, M.D., Asst. Prof. of Surgical Research.

W. Estell Lee, M.D., F.A.C.S., Prof. of Surgery.

R. H. Ivy, M.D., F.A.C.S., Prof. of Maxillo-Facial Surgery.

B. R. Beltran, M.D., F.A.C.S., Asst. Prof. of Surgery.

William Bates, M.D., F.A.C.S., Asst. Prof. of Surgery.

T. Turner Thomas, M.D., F.A.C.S., Assoc. Prof. of Applied Anatomy.

J. A. McGlinn, M.D., F.A.C.S., Assoc. Prof. of Gynecology.

The names of these men from the faculty of Amercia's oldest medical school should guarantee a successful meeting. A detailed program may be secured from the Secretary of the Adams County Medical Society, Dr. Harold Swanberg, 211-224 W. C. U. Building, Quincy, Illinois. All ethical physicians are cordially invited to attend.

RADIOLOGICAL SOCIETY OF NORTH AMERICA

The Radiological Society of North America will hold its Fifteenth Annual Meeting Dec. 2-6, 1929, in Toronto at the Royal York Hotel. Scientific sessions and clinics will occupy the five-day meeting and scientific exhibits such as have added interest to former meetings will be displayed in the fine manner for which the Society's committee in charge of this matter have distinguished themselves. The meeting place is a huge new hotel, distinguished for its roominess and luxurious appointments. Most moderate rates have been secured for those who reserve their rooms in advance, and a rate of one and one-half railroad fare on the certificate plan is available. Those who attended the Society's meeting last year in Chicago will recall the enthusiasm which marks these annual events for radiologists and clinicians and surgeons, who watch with interest the development of this specialty.

THE AMERICAN BOARD OF OTOLARYNGOLOGY

An examination was held in Portland, Oregon, July 8, during the meeting of the American Medical Association. Thirty-seven applicants appeared for examination, with 11% failures.

The next examination will be given on Monday, October 21, in Philadelphia, preceding the opening of the meeting of the American Academy of Ophthalmology and Otolaryngology in Atlantic City.

Prospective candidates for certificates should address the Secretary, Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha, Nebraska, for proper application blanks.

DR. W. P. WHERRY, Secretary

DR. H. P. MOSHER, President

AN AVERAGE GENERAL HOSPITAL

The American Hospital Association has received, among others, the reports of 676 general hospitals for the year 1928. These have been averaged by the statistician, showing a composite picture of a general hospital containing 181 beds, serving 3,353 patients a year, having a percentage of occupancy of 63.73 and operating at an average cost per patient-day of $5.32. Its annual operating receipts of $207,339.13 would be 92.37 per cent. of its annual operating disbursements. The average length of stay per patient in this hospital would be 12.56 days, and its average receipt from each patient would be $61.83.—*Federation Bulletin.*

THE TEN COMMANDMENTS OF CANCER*

1. Do not cut across a cancer and leave part behind. The part remaining will grow more rapidly than if you had left it alone, altogether.

2. An operation for cancer is an operation to save life. Cosmetic results are to be considered, but they are not to be weighed against recurrence and death a few years later.

3. Never manipulate a cancer roughly either before or during operation or more often than is necessary to make a diagnosis. To do so is the easiest way to drive cells into the lymph or blood current—hence metastasis.

4. Do not let a woman drag you into her delusion that her early cancer symptoms are due to the menopause. The menopause is a normal physiological state, and if the woman's organs are healthy she will be healthy.

5. Repair every cervix that is eroded, everted or the seat of a discharge.

6. Do not rule out cancer because the patient is not old. About 10 per cent. of cancers occur before thirty-eight.

7. Do not tell your patients they have cancer if you are sure they will follow your advice at once. If they are inclined to delay, tell them frankly what they have and what will be the consequence of delay. If they make their own choice, let it be done with full knowledge of facts and prospects. Tell the relatives or friends in any event.

8. To save your patients from cancer save them from delay. Do not wait for pain and cachexia—the signs of impending death.

9. Do not admit that incurable cancer is unrelievable cancer. Ligation, cautery, palliative removal, electrocoagulation, irradiation, and other proven physical methods may change distress to comfort and add months or years. The patient who appeals to you for relief is the one to be considered—not reputation or "the effect on the community."

10. Be always on the watch for early suspicious symptoms. Be prompt to follow them to a definite diagnosis. Be courageous enough to insist on immediate proper treatment.

*From the Weekly Rooster and Medical Digest (Philadelphia County Medical Society), June 29, 1929.

Original Articles

MEDICAL DIATHERMY IN UROLOGY—ANALYSIS OF END RESULTS DURING SEVEN YEARS

VINCENT J. O'CONOR, M. D.
CHICAGO

In order to form proper evaluation of any given therapeutic measure several requirements are essential. First, a thorough study of the various modes of applying the remedy must be undertaken to rightly determine the most efficient manner of usage and when it is advisable to utilize it. This implies more than a cursory or "rubber stamp" method of investigation.

Secondly, sufficient clinical material must be studied and treated to form a basis for drawing conclusions as to indications and contraindications. And again, from time to time an honest appraisal of end results must be made.

Something over seven years ago I became interested in the application of diathermy in the treatment of genito-urinary diseases. This interest originated in the work of my associate, Dr. B. C. Corbus, and the therapeutic possibilities which he believed control of induced heat would add to existing methods of treatment. The conclusions drawn in this discussion arise from our combined work and most of the more valuable innovations during this course of study have been orginated by him.

It is not my intention, even if time permitted, to tell the story of our various experimental studies in utilizing diathermy. It involves machines and electrodes and encouragement and discouragement. I do not purpose to go into the theories of high frequency currents or to discuss theoretical considerations. I merely intend to state what results we have obtained during this period of seven years.

The only claim that diathermy has for a therapeutic rationale is the effect which controlled heat induction can have upon disease processes and tissue repair. Beyond this, it is obvious, it has no value as a curative measure. Furthermore, it can only be considered as an adjunct to other methods of known therapeutic value in urology. Unfortunately any method which depends upon electrical apparatus, or kindred equipment for its application, immediately subjects it to the extravagant claims of commercial salesmen and too often appeals to the type of medical mind which welcomes blind or stereotyped modes of therapeutic application. The wholesale distribution of diathermy machines, many of which are in the hands of men who have done nothing more than scan the "sales" literature, bears evidence to the frequent irrationality of its usage.

The mechanism for obtaining good results in the application of medical diathermy in genito-urinary diseases depends on: A. A satisfactory high frequency machine. B. The method of conveying the heat radiation (active and inactive electrode), which should be properly designed and adjusted. C. The time of application of heat radiation, that is, any reasonable limit of not less than twenty-five minutes, which may extend as long as sixty minutes, controlled in so near as possible by thermometer readings or experience in individual tolerance. These are merely the technical considerations.

MEDICAL DIATHERMY AS AN ADJUNCT IN THE TREATMENT OF GONORRHEA IN THE MALE

Acute anterior urethritis.—There is at present, in our own experience, no satisfactory method for treating infections of the male urethra with diathermy. Occasionally a most gratifying result is obtained, but the percentage of success in our hands has been so small that it has not justified the time or energy expended.

Periurethritis.—We have treated some fifty-five patients with periurethral infiltration which occurred in conjunction with gonorrheal urethritis. In none of these had suppuration taken place before diathermy was started. Urethral treatment was stopped and by means of through and through diathermy the infected area was subjected to one or two hours heat induction a day. Hot applications and hot soaks were advised in conjunction with the above. In over fifty per cent. of these individuals the infected follicles soon became soft and established drainage through the urethral lumen. In the more persistent cases, where suppuration did not occur, prolonged diathermy over a period of ten days or two weeks gave similar results. In six a periurethral suppuration occurred, the abscess was incised and drained and after several days through and through diathermy was continued. We feel that in this class of cases, diathermy is a very great aid in avoiding a larger number

of periurethral abscesses, in shortening the course of periurethral inflammation and preventing an otherwise greater number of urethral fistulae. It also allows a more rapid and safe return to urethral medication.

In the minute retention abscesses of suppurating urethral glands not extensive enough to be designated as periurethral inflammation, the so-called "folliculitis," through and through diathermy has been most expedient in establishing free drainage of these obstructed glands into the urethra. Often only one or two periods of one hour will suffice to soften up a nidus of gonococci which might otherwise persist for several weeks.

Whenever possible we apply through and through diathermy in all instances after free drainage of a periurethral abscess has been accomplished. Here again it is our experience that tissue resolution is greatly hastened and the possibility of urethral fistula thereby lessened.

Stricture of the male urethra.—Progressive urethral dilatation is the only successful method of treating urethral stricture and while diathermy is theoretically of great value in hastening the dilatation of the more dense scars, here again we have found but a scant use for this method. At the present time we rarely find it expedient to use electrodes within the urethral lumen for this purpose. We do not feel that this is one of the important fields of usefulness for this method.

Aberrant urethral glands harboring the gonococcus.—A frequently overlooked focus for the continuance of gonorrheal urethritis is infection of aberrant urethral glands. These anomalous structures are most commonly situated in close proximity to the urethral meatus although occasionally they are found low down on the ventral surface of the penis and in rare instances, as remote as the penoscrotal junction. When present and infected, they are often the cause of otherwise unexplained recurrences or abnormally prolonged activity of the gonococcus. These are easily destroyed by the fine wire active electrode introduced to their depths so that complete coagulation of the epithelial structures results.

Gonorrheal prostatitis, prostatic abscess and seminal vesiculitis.—There is rarely an indication for the use of diathermy in the usual case of prostatitis. While diathermy has been an aid to us in some instances of chronic prostatitis the method offers little advantage over the associated treatment that is accepted as standard by most urologists. Removal of foci of infection, proper stripping and massage and appropriate urethral treatment are not greatly aided by infusion of heat in the prostate. We believe the reason for this lies in the fact that sufficient stimulant to normal drainage is usually accomplished without additional measures.

In the instance where drainage has become markedly interfered with and prostatic abscess is impending, we have found the application of rectal diathermy of the greatest value. Here the prolonged induction of heat into the gland exercises a sedative effect that seems to promote absorption and hasten natural drainage in a rapid and gratifying manner. Of seventeen recorded instances of early prostatic abscess, or "impending" abscess, thirteen subsided rapidly after rectal diathermy (two to four days), two more slowly (eight to ten days), one ruptured rectally and healed without complication, and one necessitated surgical drainage. In these as well as cases of acute seminal vesiculitis all are given rectal psychrophores for home treatment as well. Our experience leads us to feel that diathermy is a valuable aid in these conditions.

Epididymitis.—In gonorrheal epididymitis we find the greatest and most consistently valuable use of medical diathermy. It is our experience that if we can see an individual during the first twenty-four hours of the affection, we can promptly abort the usual severe course of symptoms in over ninety per cent. of the cases. Successful results depend upon early treatment, proper and prolonged (at least sixty minutes) scrotal diathermy, elevation of the testes and the usual rational behavior on the part of the patient. Several treatments on successive days may be necessary. In something less than ten per cent. of these cases, diathermy does not exert the usual rapid and resolving effect and these patients have to either undergo the usual week or ten days rest in bed with the usual measures or epididymotomy may be necessary. Our only explanation for the failure in these cases is that they may have a predominating secondary infection accompanying the gonococcus which does not respond so readily to the thermic influence. In so-called "non-specific" epididymitis our results have been more variable. In something less than fifty per cent.

the relief is rapid and the duration of the infiltration greatly lessened. In the remainder there is no markedly appreciable effect.

These conclusions are based on the treatment of slightly less than two hundred and fifty cases in the past seven years. Epididymotomy was found necessary in twelve.

Gonorrheal arthritis.—Arthritis of gonorrheal origin is very markedly benefited by through and through diathermy of the inflamed joint. In recent years we have referred these patients in the main to competent physiotherapists for this treatment as it necessitates considerable time and care. The foci are, of course, treated in the usual manner.

GONORRHEA IN WOMEN

Gonorrheal urethritis.—It is well known that under ordinary methods of treatment the gonococci do not persist in the urethral mucosa for prolonged periods, unless there is coexistent infection of the paraurethral glands. However, their more rapid disappearance after diathermy has been constant and the absence of subsequent paraurethral infection tends to the conclusion that the urethral application is most valuable for preventing this complication. In ninety-one instances of acute gonorrhea in the female where no evidence of paraurethral infection existed at the time, only three developed this complication later on. It is rarely necessary to treat the urethra more than three times when one hour urethral diathermy is given in conjunction with other treatment.

Gonorrheal endocervicitis.—Two hundred and fifteen women have been treated prior to May, 1927, by endocervical diathermy. Thirty-eight have had additional cauterization of cervical glands and follicles. Of this number, eighty-five have been checked for more than three years and forty-two for more than two years. The remainder were not seen after the cessation of active treatment and were not available for observation after the three month period following the application of their discharge technic.

The application of endocervical diathermy in order to obtain these results must be accurately and carefully controlled and wherever areas of infection are present that do not come in direct contact with the radiation areas, these should be cauterized by surgical diathermy or the actual cautery.

Infection of Skene's or Bartholin's glands.—Eradication of these foci is most important. The paraurethral glands are most satisfactorily treated by diathermic coagulation into the urethral lumen. Bartholin gland infections may occasionally be successfully treated by through and through diathermy or deep electrocoagulation with a needle electrode. In the majority of of instances drainage and later excision of the gland, is most satisfactory. Any acute inflammation of the uterine adnexa contraindicates all intracervical treatment, as does likewise pregnancy, and the very early acute stages of the disease.

Gonorrheal salpingitis.—In the acute stages of tubal infection with pelvic pain, elevation of temperature and leukocytosis, it is generally agreed that palliative treatment is advisable unless gross suppuration occurs. Through and through diathermy has been a very valuable additional palliative measure at this time. The clinical course of the disease requires careful consideration and the effects of the treatment should be distinctly beneficial. Any increase in pelvic pain or immediate elevation of more than one degree of temperature is regarded as a contraindication for further diathermy at this time. If drainage is taking place from the tubes through the cervix, the results of diathermy should be favorable and clinically in our experience greatly shortens the duration of the disease.

Chronic cavernositis and plastic induration of the penis.—Fibrosis of Buck's fascia variously described as chronic cavernositis, plastic induration of the penis and fibrosis of the corpora cavernosa, is one of the most difficult conditions which the urologist is called upon to relieve. During the past seven years we have treated five cases of this nature with diathermy. These patients complain of pain in the penis, accentuated during erection, bowing or crookedness of the penis when erect, and varying degrees of urethral obstruction. Constantly repeated local infusions of heat into the fibrotic area is the only treatment up-to-date which has given any measure of success in our hands. The response to diathermy is very slow, but if persisted in will give definitely beneficial results. The treatment entails hourly treatments at frequent intervals over a period of time occupying from three months to a year.

In one instance in which treatment lasted for

almost eighteen months there was complete relief of symptoms and about fifty per cent, reduction in size of the fibrotic area. In another instance, where bowing of the penis during erection was the chief complaint, complete relief was afforded after three months of diathermy treatments given for one hour, three times each week. The size of the fibrotic mass was not diminished, although it was considerably softened in texture and has so remained for over two years. In the third instance, painful urination was relieved after twelve treatments, although urethral dilatation may have been the really beneficial therapeutic agent in effecting this, since the sclerosis was neither diminished in size or in texture.

In the other two individuals no relief was obtained after seven and ten treatments respectively. Both of these patients had a definite lime salt deposit, as shown by x-ray, although we felt that the period of treatment was inadequate to expect appreciable result.

THE PREVENTION OF NEO-NATAL MORTALITY FROM THE STANDPOINT OF THE OBSTETRICIAN

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At present, as nearly as can be known, about twenty thousand women die annually in the United States from causes incident to pregnancy and labor. It is estimated that the loss of infant life is nearly 120,000. Eighty-five per cent. of the maternal mortality is preventable, that is, if all women were confined in well organized maternities under experienced obstetric care, the great majority of obstetric deaths would not occur. It is impossible to say how many women, in addition to those who die, are left in a condition of greater or less invalidism as a result of birth injury or infection, nor can we know how many infants, besides the number who are lost, begin life hampered by the results of birth trauma. It is difficult to make any dogmatic statement as to the number of infant deaths and injuries which may be prevented, since statistics upon which such an estimate must be founded are impossible to get. It is probable, however, that more than half of the infant deaths might be avoided and probably at least as large a proportion of the injuries.

The necessity of lessening this loss of life and this toll of injury has engaged the attention of national societies and of the American Medical Association, and committees have been appointed to study the matter.

From the viewpoint of the obstetrician, the remedy is easily stated. The average quality of obstetric work in the country must be improved. This is easily said, but its accomplishment will require consistent effort for a long time. So long as the majority of deliveries are in the hands of men in general practice this will be difficult to remedy completely. Most men in family practice find their primary interests to lie in other fields, and obstetric cases are taken of necessity rather than from choice.

Prevention of infant mortality so far as the obstetrician can influence it depends upon the care given the mother during pregnancy and during labor. The tremendous importance of pre-natal care of the mother is being emphasized at present more strongly than ever before. As our discussion tonight centers 'round the infant, all phases of pre-natal care will be omitted except those which directly concern the infant after the period of viability.

One of the most essential things from this standpoint is an exact knowledge of the pelvic diameters. A seaman who attempts to enter a harbor without knowing the depth of water in the channel would be regarded as careless or incompetent, but the fatal bark is too often started on its parturitional voyage without its obstetric pilot having troubled to ascertain whether reefs and sand bars in the form of pelvic deformities lie before it. The result is a dead or injured baby. The knowledge that a contracted pelvis is present enables the physicion to so conduct the labor that in the majority of cases the infant may be saved.

Toxemia and its sequence, eclampsia, is one of the three great causes of maternal death. Severe toxemia and eclampsia increase definitely the risk which the child undergoes. These conditions are to a considerable degree preventable. The prevention of serious toxemia calls for constant and regular observation during pregnancy. This observation may be done by any practitioner of ordinary intelligence, and nothing but the equipment of the simplest office laboratory is required. The timely recognition of on-

coming eclampsia enables the physician to institute measures for the control of the toxemia or for the termination of the pregnancy before both mother and child are seriously endangered.

That the simple measures for the recognition of both the foregoing complications are frequently omitted is known to every active obstetrician, particularly if he is in contact with hospital work. Many fetal deaths annually are the inevitable result.

The incidence of syphilis in pregnancy varies greatly with the source from which one takes one's figures. In the private practice of the specialist it occurs infrequently but is not unknown. In dispensary practice it is more frequent. Williams in 1920 in a series of 4,000 cases found a positive Wassermann in 11.2 per cent. The Johns Hopkins service contains a large proportion of colored patients, and among these the Wassermann was positive in 16.29 per cent. Figures from the almost entirely white service of the University of Michigan clinic and from the Long Island College Hospital show about 6 per cent. of positive Wassermann reactions in both places. It is therefore always to be reckoned with and is more frequently found in dispensary and hospital ward service than privately. Without discussing all of the points brought out by Williams, he was able to show that energetic treatment of the syphilitic pregnant woman reduces very greatly the number of children born syphilitic. If the treatment of these potentially infected children is begun in utero the subsequent task of the pediatrician is materially lightened. There is no reason why such treatment cannot be given during pregnancy. Even if no opportunity for giving treatment is had until late in pregnancy, the child is benefited and its resistance to colds, bronchitis and so on which may be acquired soon after birth is increased. It is wiser for the obstetrician to delegate the management of anti-syphilitic treatment to someone of experience in this work, and this is the plan always followed in our own work. Congenital syphilis forms a considerable proportion of the inmates of our asylums for the feebleminded, jails and correctional institutions. It is of immense practical importance to diminsh the number of these individuals, and the obstetrician has the first chance. It is clearly shown by Williams' figures that energetic pre-natal anti-syphilitic treatment will aid greatly in lessening the number of syphilitic infants. Here we find one of the opportunities for the obstetrician to decrease neo-natal morbidity and mortality.

The conduct of labor has an important bearing on infant mortality and morbidity. Inability to recognize impediments to the normal course of labor caused by the bony pelvis and by abnormalities of the soft parts, and lack of knowledge of how to deal with them are responsible for many deaths. Each year I see, as does every physician who sees a large number of obstetric cases, women in whom a history of long labor followed by difficult forceps or version followed by delivery of a dead or moribund baby, is obtained. At one time in the past year, in addition to the cases seen otherwise, five private patients were under observation at one time with such histories. In four of them a diagnosis of contracted pelvis could be made by the usual simple methods within five minutes. All of them were delivered safely of living children. All of them could have been so delivered the first time had they been in any well organized and competently directed maternity. The five infant lives were a sacrifice to deficient obstetric knowledge. Contracted pelves cause a large number of infant deaths. Yet in the hands of experienced obstetricians, who take care always to know in advance with what bony diameters they have to deal, the infant mortality is low. For example, in Bailey's report in 1926 from the Bellevue Hospital of the treatment of 477 cases of contracted pelvis seen in that institution in the years 1922 to 1925, the infant mortality was 4.19 per cent. This is an excellent showing. That this can be done elsewhere is shown by the recent report of Lynch from the University of California Clinic, in which in a similar series of cases comparable results were obtained. This simply means that good obstetrics bring results for the baby as well as for the mother.

During the past year there were delivered in the Evanston Hospital 837 women. To indicate what may be accomplished in a general hospital in the limitation of fetal loss of life, I will give the figures for infant mortality. The total number of fetal deaths was 32, a percentage of 3.8 per cent. Of these 22 were premature, that is, less than eight months, many of them being

much earlier. Of deaths which might be termed avoidable, that is, infants which were alive at the beginning of labor and which were lost during or shortly after labor there were 7, a percentage of 0.83 per cent. There were 22 unavoidable deaths, due either to prematurity or some congenital defect, such as congenital heart defect or anencephalus. Of the seven deaths we term avoidable, one was a case of placenta praevia at 8 months delivered by version, one was a twin birth, the infants weighing about 3¼ pounds apiece, one was a traumatic cerebral hemorrhage and four are recorded as cause unknown, but probably cerebral hemorrhage. Autopsy in these four cases was refused.

In the private work of myself and my associate, Dr. C. E. Galloway, for the past three years 1,083 women have been delivered. All of these deliveries occurred in the hospital. Of these cases 130 terminated before the seventh month. In pregnancies advanced to seven months or beyond before delivery occurred there were 27 deaths. In 13 of these stillbirths occurred, 8 being premature and 6 at term. Fourteen deaths after delivery occurred, eight being premature and six at term.

Of obstetrical deaths at term, that is, deaths which may be charged to the labor, there were six, or 0.55 per cent. Including all deaths which may be termed unavoidable there were 15 or 1.38 per cent. These were due to some congenital defect which made life impossible. The total deaths at nine months from all causes came to 1.2 per cent.

The women who made up this series all received constant and painstaking pre-natal observation and they were all delivered according to best obstetric teaching. These results are not spoken of as being extraordinary, for experienced workers in similar institutions obtain results which are just as good. They are quoted for the purpose of showing that careful pre-natal observation followed by intelligent, painstaking and conservative treatment during labor brings definite results which are as apparent in the infant mortality and morbidity as in the maternal.

In contrast with this, the writer recently heard quoted the results of a small hospital in this state in which the number of cases for the year was about equal to one month's work in our service, in which the fatal mortality was 10 per cent. It is probable, too, that in this latter institution the physicians did the best they knew. That an urgent need exists for the improvement of the average quality of obstetric work cannot be doubted. A tremendous necessity exists for a more widely spread knowledge among physicians of the necessity of pre-natal care and for a better understanding of labor and its management.

During the past few years various phases of operative obstetrics have been discussed and different methods of terminating labor have been suggested. The results obtained by the expert in the organized maternity have tempted many with little experience and deficient surgical surroundings to attempt procedures for which they were ill qualified. The result can only be an increase of both maternal and infant mortality and morbidity. The importance of intelligent expectancy practiced by a doctor who has been properly taught the normal mechanism of labor should be emphasized. As Bumm has said, "they are poor obstetricians who cannot await the safe processes of nature."

The misuse of pituitrin has cost numbers of infant lives. The giving of pituitrin to the undelivered woman under any but the most carefully selected circumstances is blameworthy and may subject both mother and child to danger. It is not uncommon for it to be used in doses of one-half centimeter or of one centimeter in the cases of women with partially dilated cervices or in cases in which a slight disproportion requires time for the moulding of the fetal head. This practice can only be condemned as it adds materially to the danger of both mother and child. The great cause of death of infants in these unwise operative procedures and in the indiscreet use of pituitrin is hemorrhage of the brain and into the spinal canal. The so-called asphyxia of the newborn child is usually one or both of these. This is commonly recognized by obstetricians and it is important that it should be widely known by the profession at large. A clear understanding of this fact will help to cause the physician to approach operative procedures with circumspection and will aid in reducing the number of fetal deaths from this cause. If a clear understanding of the indications for forceps and a definite knowledge of the proper method of using this instrument were possessed by every practitioner who does ob-

stetrics many injuries and a considerable number of infant deaths would be prevented.

For the best results in the care of newly born infants co-operation between the obstetrician and pediatrician is essential. There is no reason why the same man may not do pediatrics and obstetrics, provided he is able to give his patients efficient service in both branches. Unfortunately but few men can do this. Pediatrics is a medical specialty while obstetrics and gynecology is a surgical one. With the rapid growth of medical knowledge it taxes the powers of even an industrious man to keep properly abreast of all advances in one department of medicine, particularly if he is carrying on a large practice. How one individual can do really good work in two fields as dissimilar as these it is difficult to see. I have for years been convinced that efficient work in both fields by one man is impossible. It is difficult to serve two masters. One will be a good obstetrician and an indifferent pediatrician or the reverse. In our own hospital all babies born in the ward service become pediatric patients immediately upon delivery. No member of our department is permitted to prescribe for them or treat them in any way except when resuscitation is necessary at the time of delivery. Private patients are asked within the first day or two whom they wish as pediatric attendant, and, if necessary, one is recommended.

We have had no difficulty in the matter with our patients, most of whom approve heartily of this plan. I am convinced that it is to the best interests of the infants, for they come at once under the observation of the physician whose primary interest they are. It is to the interest of the obstetric attendant, for it is easy for an obstetric success to be over-shadowed in the mind of the patient by a pediatric error.

I conclude, then, as I began. From the point of view of the obstetrician a reduction of infant mortality and morbidity is directly contingent upon an improvement in obstetric practice. The results attained by expert obstetricians, both for mother and child, and the comparison of such results with those obtained by less experienced and less fortunately situated men, prove this. More hospitals are needed not only in large centers but in smaller communities. And greater emphasis upon the essentials of obstetrics is vital.

In conclusion the obstetrician would emphasize the following points: 1. All women, in the interests of their babies as well as in their own, should receive conscientious pre-natal care.

2. A wider spread and much clearer understanding of fundamental obstetric problems by the profession generally will aid in lessening loss of infant life.

3. Whenever possible, that is in communities in which specialization of practice prevails, the infant after birth should be cared for by a pediatrician. A combination of pediatrics with obstetrics is illogical and can only lead to lack of efficiency in one or the other.

ABNORMALITIES OF THE BILE DUCTS, AND THEIR BLOOD VESSELS AND THEIR SURGICAL SIGNIFICANCE*

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Because of the frequency of operations on the gall-bladder and bile tracts and of the rather common injuries to the bile ducts and sometimes fatal hemorrhage encountered, a knowledge of the anomalies of the bile ducts and their vessels is desirable by all surgeons doing gall-bladder surgery. Variations are very frequent and the subject is of importance to surgeons as to the causes of such accidents and of their prevention in the future. Flint, of London, has made 200 dissections on postmortem subjects of the bile tract and its blood supply. He found only sixty-nine cases, or twenty-four per cent, which conformed to the type given as normal in the textbooks of anatomy.

The type described as normal in textbooks of anatomy consists in the union of the hepatic and cystic ducts at an acute angle with the hepatic artery passing below the common hepatic, and the cystic artery arising from the right hepatic just to the right of the common hepatic duct and entering the gall-bladder at the junction of its neck with the cystic duct. Covering the com-

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*Read before Los Angeles County Medical Society, Ohio Valley Medical Society, Evansville, Ind., and Jackson Park Branch Chicago Medical Society.

*From the Surgical Department, Michael Reese Hospital.

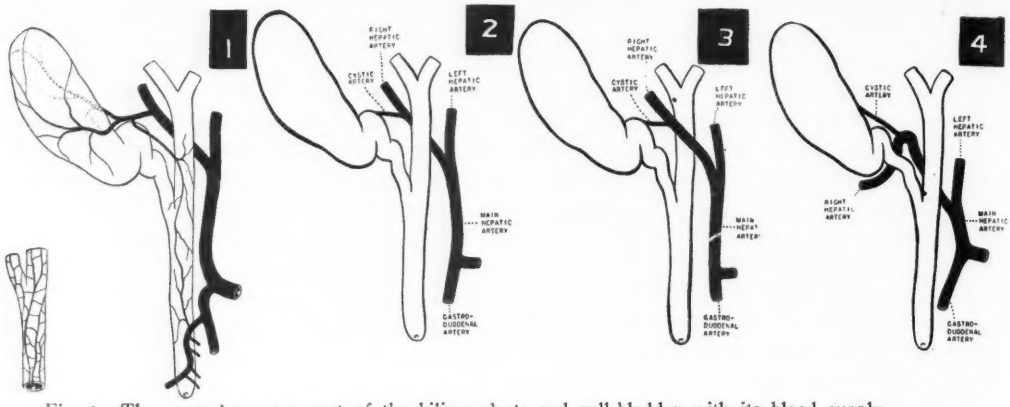

Fig. 1. The normal arrangement of the biliary ducts and gall-bladder with its blood supply.

Fig. 2. Right hepatic artery arising from the main hepatic trunk and passing behind the main hepatic duct.

Fig. 3. The right hepatic artery crossing in front of the main hepatic duct.

Fig. 4. Right hepatic artery running parallel to the cystic duct and lying in close proximity to the neck of the gall-bladder.

mon duct there is a plexus of veins and arterioles. (Fig. 1).

Our knowledge of the anomalies of the bile ducts and blood vessels is in great measure due to the work of Rio Branco, Des Comps, Ruge, Kunze, Eisendrath and Flint.

The most important vascular anomalies are the following:

1. *The Right Hepatic Artery.*—This artery varies greatly in its relations to the main hepatic and cystic ducts.

(a) In seventy per cent of cases it arises from the main hepatic trunk and to reach the liver passes behind the common hepatic duct (Fig. 2).

(b) In twelve per cent of cases the right hepatic artery crosses the front of the hepatic duct or even the common duct (Fig. 3).

(c) In ten per cent. of cases the right hepatic artery may run parallel and very close to the cystic duct and the neck of the gall-bladder, almost suggesting a double cystic duct. It could be very easily included in the clamp applied to the cystic duct (Fig. 4). Figure 5 shows a specimen demonstrating a normal angular mode

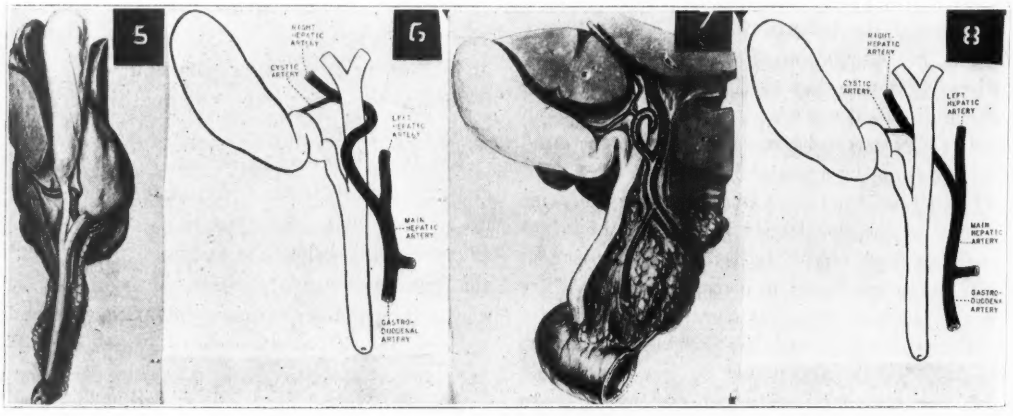

Fig. 5. Specimen demonstrating a normal angular mode of union of the cystic and hepatic ducts.

Fig. 6. Right hepatic artery arching over right edge of the main hepatic duct.

Fig. 7. Specimen showing how right hepatic artery forms a loop in front of the hepatic duct.

Fig. 8. Cystic artery arising from the right hepatic artery.

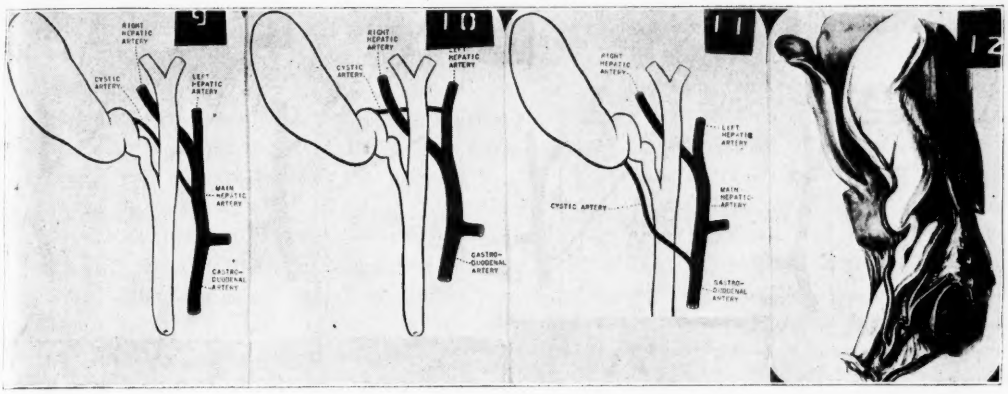

Fig. 9. Cystic artery arising from the main hepatic.
Fig. 10. Cystic artery arising from the left hepatic.
Fig. 11. Cystic artery arising from the gastro-duodenal artery.
Fig. 12. Specimen demonstrating the cystic artery arising from the gastro-duodenal artery and crossing the common duct obliquely to reach the lower side of the gall-bladder.

of union of the cystic and hepatic ducts. The main feature of the specimen is that the right hepatic artery is at first parallel to the cystic duct, then passes close to the neck of the gall-bladder, and enters the right lobe of the liver. This anomaly is of great importance in connection with possible injury of the artery during cholecystectomy.

(d) In eight per cent. the right hepatic artery crosses the right edge of the main hepatic duct and then enters the liver or forms a ring around the hepatic duct (Fig. 6). Figure 7 shows specimen demonstrating how right hepatic artery forms a loop in front of the hepatic duct.

(e) In twenty-one per cent. of cases the right hepatic artery arises from the superior mesenteric artery and always passes behind the common duct.

(f) In three per cent. of cases there are two right hepatic arteries, one from the hepatic trunk and one from the superior mesenteric. Flint reports two cases in which two right hepatic arteries arise from the main hepatic, one passing in front of and the other behind the common hepatic duct.

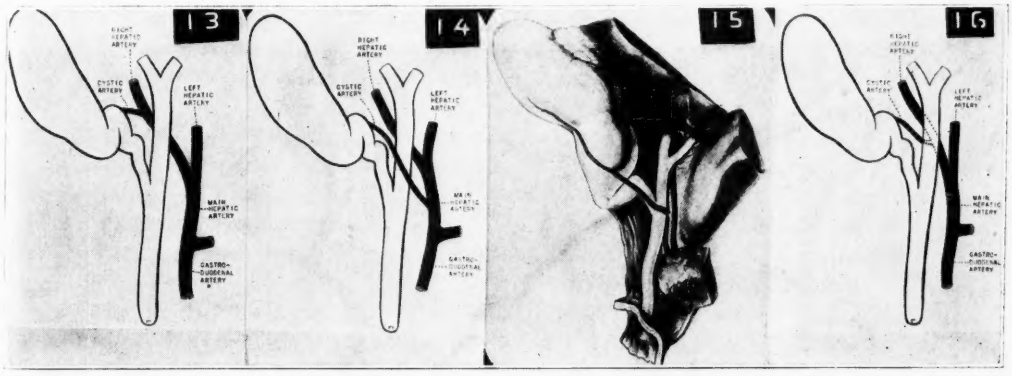

Fig. 13. Cystic artery arising to the right of the main hepatic duct.
Fig. 14. Cystic artery arising to the left side of the hepatic or common duct and must cross one of these to reach the neck of the gall-bladder.
Fig. 15. Specimen showing the cystic artery arising on the left side of the main hepatic duct and crossing the latter to reach the neck of the gall-bladder.
Fig. 16. Cystic artery arising behind the main hepatic duct.

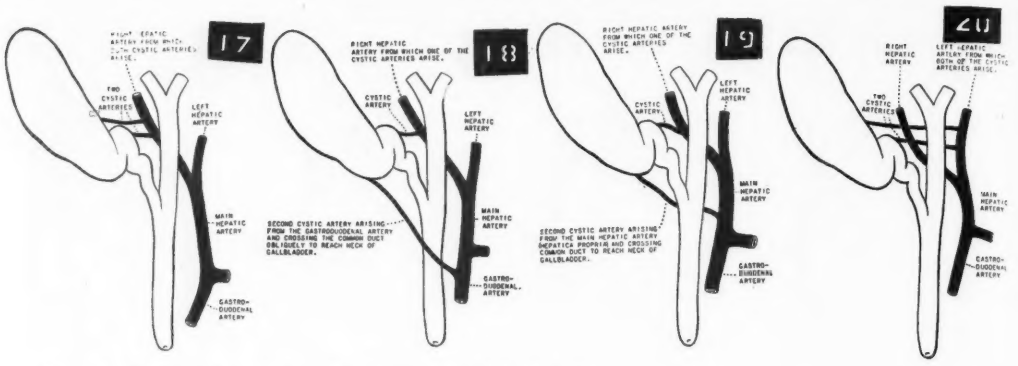
17
TWO CYSTIC ARTERIES
LEFT HEPATIC ARTERY
MAIN HEPATIC ARTERY
GASTRO-DUODENAL ARTERY
18
RIGHT HEPATIC ARTERY FROM WHICH ONE OF THE CYSTIC ARTERIES ARISE.
CYSTIC ARTERY
LEFT HEPATIC ARTERY
MAIN HEPATIC ARTERY
SECOND CYSTIC ARTERY ARISING FROM THE GASTRODUODENAL ARTERY AND CROSSING THE COMMON DUCT OBLIQUELY TO REACH NECK OF GALLBLADDER.
GASTRO-DUODENAL ARTERY
19
RIGHT HEPATIC ARTERY FROM WHICH ONE OF THE CYSTIC ARTERIES ARISE.
CYSTIC ARTERY
LEFT HEPATIC ARTERY
MAIN HEPATIC ARTERY
SECOND CYSTIC ARTERY ARISING FROM THE MAIN HEPATIC ARTERY (HEPATICA PROPRIA) AND CROSSING COMMON DUCT TO REACH NECK OF GALLBLADDER.
GASTRO-DUODENAL ARTERY
20
RIGHT HEPATIC ARTERY
TWO CYSTIC ARTERIES
MAIN HEPATIC ARTERY
GASTRO-DUODENAL ARTERY

Fig. 17. Two cystic arteries arising from the right hepatic.
Fig. 18. One cystic artery arising from the right hepatic, and the other from the gastro-duodenal artery.
Fig. 19. Accessory cystic artery arising from the main hepatic.
Fig. 20. Two cystic arteries arising from the left hepatic.

2. *The Cystic Artery.*

1. *Anomalies in origin of the single cystic artery.*—

(a) There is only one cystic artery in eighty-eight per cent. of individuals. In eighty-two per cent. of these it arises from the right hepatic artery (Fig. 8).

(b) In three per cent. of the eighty-eight per cent. the cystic artery arises from the main hepatic (Fig. 9).

(c) In two per cent. of the eighty-eight per cent. the cystic artery arises from the left hepatic and may retract greatly when divided (Fig. 10).

(d) In three per cent. of the eighty-eight per cent. the cystic artery arises from the gastro-duodenal artery. This must cross the front of the common duct to reach the neck of the gall-bladder and is a very important anomaly as far as the source of bleeding is concerned (Fig. 11). Figure 12 shows specimen demonstrating the cystic artery arising from the gastro-duodenal artery and crossing the common duct obliquely to reach the lower side of the gall-bladder.

2. *Relation of the single cystic artery to the main hepatic duct.*—

(a) In seventy-two per cent. of individuals the cystic artery arises to the right of the main hepatic duct (Fig. 13).

(b) In twenty-seven per cent. the cystic artery arises on the left side of the hepatic or common duct and must cross one of these to reach the neck of the gall-bladder (Fig. 14). Figure 15 shows specimen demonstrating the

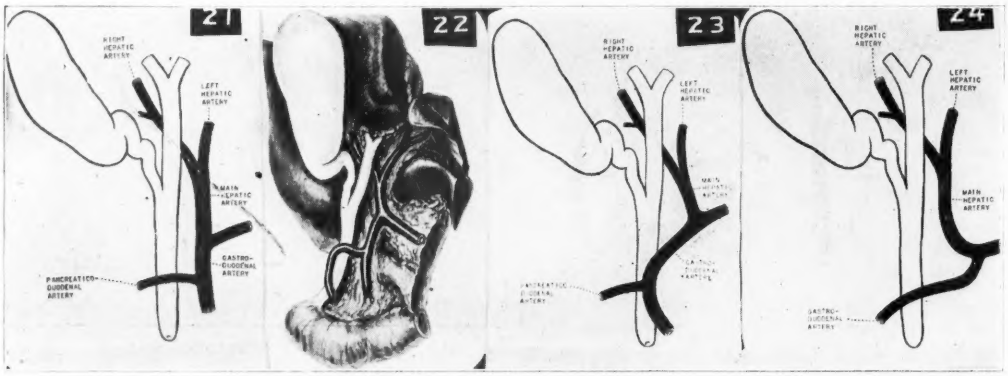

Fig. 21. Pancreatico-duodenal artery crossing the common duct.
Fig. 22. Specimen demonstrating pancreatico-duodenal artery crossing common duct.
Fig. 23. Gastro-duodenal artery reaching across the left border of the common duct.
Fig. 24. Gastro-duodenal artery passing across the front of the common duct.

cystic artery arising on the left side of the main hepatic duct and crossing the latter to reach the neck of the gall-bladder.

(c) In two per cent. the cystic artery arises behind the main hepatic duct and if it should retract, it is easy to include the duct in the grasp of the forceps. (Fig. 16.)

3. *Accessory Cystic Artery.*—In twelve per cent. of individuals there is an accessory cystic artery. Attention is not called to this in the anatomy books.

(a) In eight per cent. of cases having two cystic arteries, both vessels arise from the right hepatic artery. (Fig. 17.)

(b) in two per cent. one artery arises from the right hepatic artery and the other from the gastro-duodenal. (Fig. 18.)

(c) In one per cent. the accessory artery arises from the main hepatic. (Fig. 19.)

(d) In one per cent. both vessels arise from the left hepatic. (Fig. 20.)

In the instance where the accessory cystic artery arises from the gastro-duodenal, it is liable to injury during the operation of choledochotomy. Ignorance of the occurrence of the accessory cystic arteries may be responsible for rather severe hemorrhage.

4. *Gastro-Duodenal Artery.*—This is of importance in common duct operations.

(a) In seventy-six per cent. of individuals the pancreatico-duodenal artery, a branch of the gastro-duodenal, crosses the common duct (Fig. 21). Figure 22 shows specimen demonstrating the pancreatico-duodenal artery crossing the common duct.

(b) In thirty-eight per cent. the gastro-duodenal artery reaches across the left border of the common duct. (Fig. 23.)

(c) In twenty per cent. the gastro-duodenal artery itself passes across the front of the comman duct. (Fig. 24.)

5. *The Bile Ducts.*—According to text-books on anatomy, the right and left hepatic ducts unite in the portal fissure or just beyond it to form the common hepatic duct. This structure is from one inch to one and one-quarter inches long. The cystic duct is from one inch to one and one-half inches long, and uniting with the common hepatic duct at an acute angle, they together form the common bile duct which is about three inches long. The length of the supra-duodenal part of the common duct varies with the level of the duodenum, and the point at which the cystic and common hepatic ducts join, the average length of this part of the duct being held to be about one-third of the whole length of the common duct. Now, though it is true that the cystic and common hepatic ducts do come together at such a point as to give an average of length as stated, they do not unite here. Almost always they are nearly bound together by fibrous tissue and by dissection it is possible to separate them from each other to as much as two inches or more.

In only seventy-five per cent. of individuals do the cystic and hepatic ducts unite at an acute angle. (Figs. 25 and 26.) When this does occur, the terminal two centimeters are firmly held together by fibrous tissue. In seventeen per cent. the ducts pursue a parallel course before they unite. The latter is usually one-half to one centimeter above the ampula. In Figs. 27 and 28 the hepatic duct and cystic duct are bound together for five centimeters. Figures 29, 30 and 31 show a long parallel course of the cystic and hepatic ducts. The two become united close to the ampulla and are bound together by strands of fibrous tissue. In eight per cent. the cystic duct makes a spiral twist around the front (Fig. 32) or back (Fig. 33) of the main hepatic duct before they unite to form the common duct. Figure 34 shows a specimen demonstrating the anterior spiral mode of union of cystic and hepatic ducts. The cystic duct crosses the front of the main hepatic duct to enter its left side. In Figure 35 the specimen demonstrates the posterior spiral mode of union of cystic and hepatic ducts. Note how the cystic duct winds around the posterior aspect of the hepatic duct to enter on the left border of the latter. Figure 36 shows specimen demonstrating the anterior spiral mode of union of cystic and hepatic ducts. The cystic duct makes a turn of a quarter of a circle before uniting with the hepatic duct. Note the unusual length of the common duct.

6. *Accessory Bile Ducts.*—These were found in eighteen per cent. of individuals. All of them were accessory right hepatic ducts. The duct leaves the liver at the extreme right end of the portal fissure, and lying at first on a rather deeper plane than the cystic duct, joins the

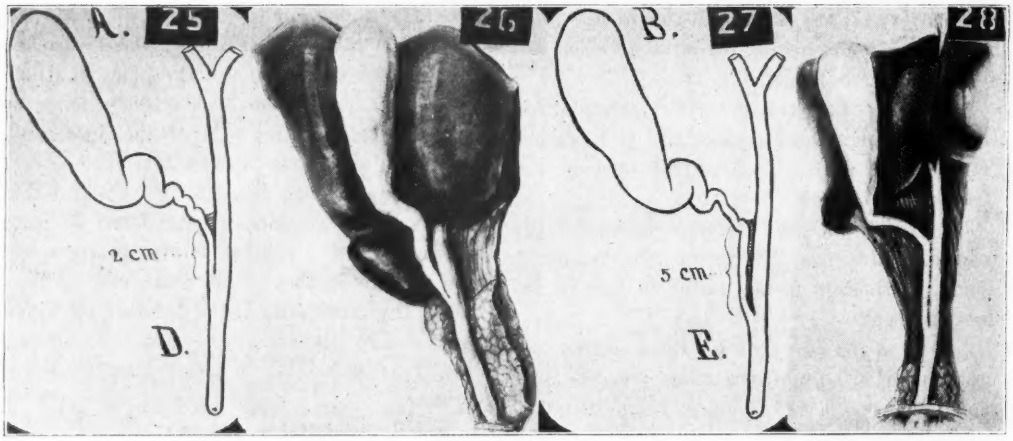

Fig. 25. Cystic and hepatic ducts uniting at an accute angle, showing the terminal two centimeters firmly held together by fibrous tissue.

Fig. 26. Specimen demonstrating cystic and hepatic duct uniting at an acute angle.

Fig. 27. Terminal portions of hepatic and cystic being bound together for five centimeters.

Fig. 28. Specimen demonstrating cystic and hepatic ducts bound together for five centimeters.

extra-hepatic ducts anywhere between the junction of the right and left hepatic ducts and the point at which the cystic duct opens into the main duct. It usually has the same relation to the right hepatic artery as the normal ducts, that is, the artery passes behind the duct. There is no reference in the anatomy books to an accessory duct.

These accessory ducts may be classified into three types according to the level at which they enter the main duct. This is done from a surgical rather than from an anatomical standpoint:

1. The junction of the accessory duct with the right hepatic duct. In this type the union is so high up that the duct is unlikely to be of surgical importance.

2. The junction of the accessory duct with the common hepatic duct. The union is so near

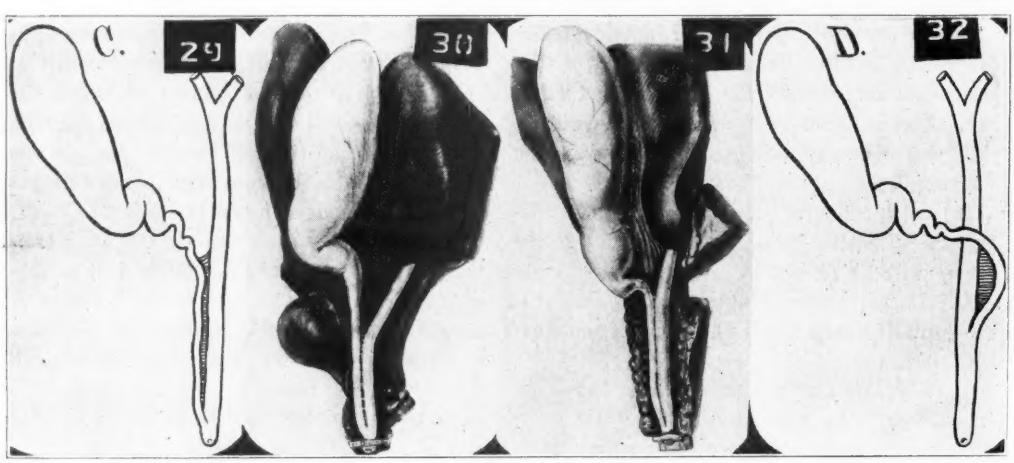

Fig. 29. A long parallel course of the cystic and hepatic ducts which unite just above the ampulla.

Fig. 30. Specimen demonstrating a long parallel course of the cystic and hepatic ducts.

Fig. 31. Another specimen demonstrating a long parallel course of the cystic and hepatic ducts uniting just above the ampulla.

Fig. 32. Cystic duct making a spiral twist around the front of the hepatic duct before uniting to form the common duct.

that of the cystic and common hepatic ducts as to be definitely in the field of cholecystectomy operation.

3. The junction is at the union of the cystic and common hepatic ducts. The junction is usually in the actual angle but may be in the extreme lower end of the cystic duct or in the extreme lower end of the common hepatic duct. In any case it is difficult to see how the duct could be avoided while clamping the cystic duct, unless its presence had been previously detected. In Kehr's case two accessory hepatic ducts emptied into the gall-bladder.

The size of these accessory ducts varies. The smallest is only large enough to admit a good-sized bristle. The largest is as big as the right hepatic duct. The commonest size is about halfway between these limits. There is one other abnormality which is a curiosity rather than of practical interest and that is congenital obliteration of the bile ducts in the new-born.

The Surgical Significance of These Abnormalities

Practically all the accidents to the ducts and vessels occur during the operation of cholecystectomy with or without choledochotomy and since cholecystectomy has almost entirely displaced cholecystostomy it is obviously the duty of every surgeon to make himself familiar with the normal anatomy of these parts.

It is customary for several reasons to begin the removal of the gall-bladder at the cystic duct and it is here that all the traps lie. There is only one way to avoid catastrophes, that is, to fix the neck of the gall-bladder with a clamp, and after cutting through the gastrohepatic ligament near this point to wipe gently the fatty tissue towards the common duct. The cystic duct and artery now come clearly into view and can be separately secured. If there should be an accessory artery or duct it will be exposed to view before being divided, and the junction of the cystic duct with the main duct can be seen distinctly. There are a few cases, however, in which the tissues are deformed, thickened, and contracted by inflammation so that it is not possible to obtain a really clear definition. It is in this type of case that the most expert surgeons have probably all had unhappy experiences.

Secondary operations on gall-bladder cases have to be performed much too often, for I venture to say that ninety-nine out of one hundred could be avoided by a proper definition of the parts at the original operation combined with a better knowledge of the pathology of the gall-bladder. The commonest blunders committed at the primary operation are:

1. Leaving the gall-bladder through an inadequate appreciation of its pathology.
2. Overlooking a stone in the cystic or common duct.
3. Injury to the cystic, common hepatic or common bile duct.
4. Injury to an accessory hepatic duct.

(1) The first group is beyond the scope of this paper.

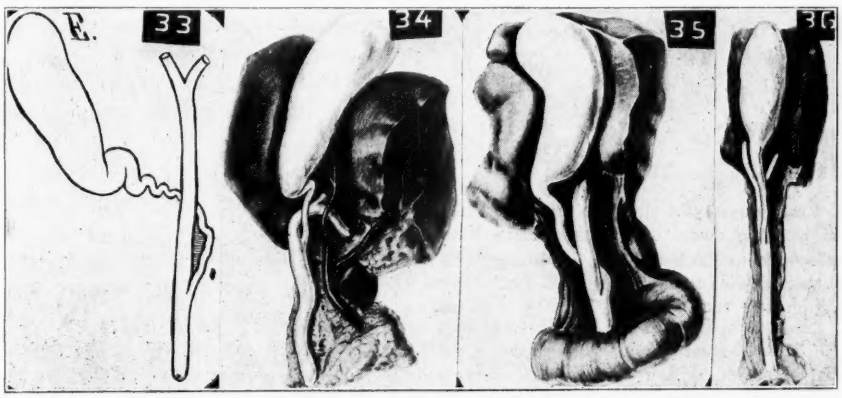

Fig. 33. Cystic duct making a spiral twist around the back of the hepatic duct.
Fig. 34. Specimen showing anterior spiral mode of union of cystic and hepatic ducts.
Fig. 35. Specimen demonstrating spiral mode of union of cystic and hepatic ducts.
Fig. 36. Another specimen demonstrating the anterior spiral mode of union of cystic and hepatic ducts.

(2) In the second group, difficulty might arise through a spiral arrangement of the cystic duct referred to above. A stone in that part of the duct which lies behind or in front of the common duct might be missed, or to expose it the common duct might be opened unnecessarily. Anyone unacquainted with this anomaly would be much perplexed on finding that he had opened two ducts to get at a stone which he had expected to find in the common duct. A stone in the normally located cystic duct or in the common duct should never be overlooked after a proper exposure of the parts.

The abnormal arteries which may be encountered in opening the common duct have already been alluded to. The superior pancreatico-duodenal and gastro-duodenal arteries may be wounded in the transduodenal method of opening the common duct, for either vessel may lie in front of the duct just above the ampulla of Vater.

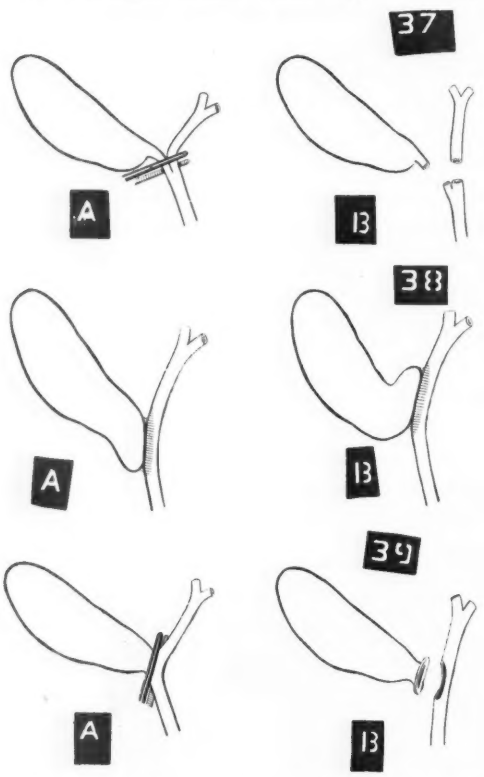

Fig. 37. Resection of the junction of the cystic, hepatic and common ducts, which might arise from the angulation due to traction during cholecystectomy when a clamp is applied to the cystic duct. (A.) Defect remaining after such an injury. (B.)

Fig. 38. Tear or division of the main hepatic duct which might arise in separating the upper side of the pelvis of the gall-bladder from the duct. (A). Same type of injury which might arise in separating the lower side of the pelvis of the gallbladder. (B.)

Fig. 39. Clamping the hepatic and common ducts when cystic duct is very short. (A.) Defect remaining after such an injury.

(3) The injuries inflicted on the cystic, common hepatic or the common bile duct practically always occur for one reason, that of not seeing clearly the various structures before applying the clamp. There are four types of injury which may be classified as follows:

(a) A resection of the junction of the cystic, hepatic and common ducts. This often results from the angulation incident to traction during cholecystectomy, especially when a clamp is applied to the cystic duct. "A" of Fig. 37. The defect remaining after such an incision of the angle of junction of the three ducts is shown in "B" of Fig. 37.

(b) Tear, ligation, or division of the main hepatic duct during cholecystectomy. This injury may occur during separation of the pelvis (whether on the upper or lower side) of the gall-bladder, "A" and "B" of Fig. 38, from the common or hepatic ducts or when the cystic duct is very short, is much dilated, "A" and "B" of Fig. 39, or when the cystic and hepatic ducts are parallel, Fig. 40, or the cystic duct winds around the main hepatic duct, Fig. 41.

(c) Common duct resected. This may occur in one of the ways described under (a) and (b) or the duct may be included in a clamp, resected or divided during cholecystectomy or it may be torn during a choledochotomy.

(d) Main hepatic or common ducts ligated or resected during effort to grasp the bleeding stump of a single cystic artery, Fig. 42, or an overlooked single cystic artery having an anomalous origin, Fig. 43, or a second cystic artery, Fig. 44.

(4) In the fourth group the accessory ducts are injured. There is no literature on this subject, for surgeons are unaware that these ducts exist and certainly are not in the habit of looking for them at operation. Kehr has reported a case in which the right hepatic duct emptied into the cystic duct and was included in the clamp applied to the cystic duct.

Flint believes that these ducts are injured as

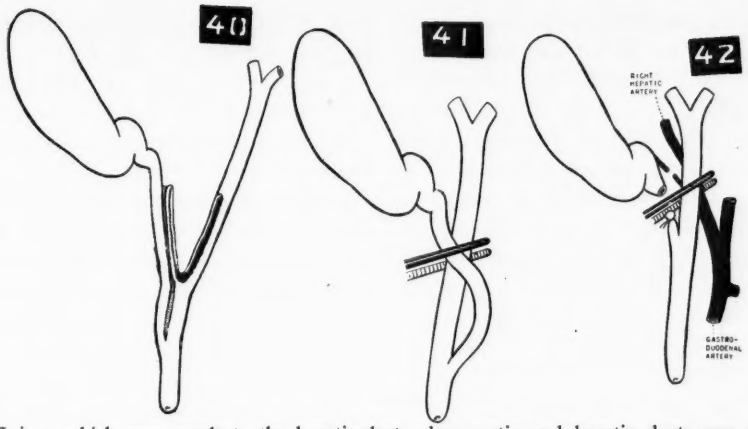

Fig. 40. Injury which may result to the hepatic duct when cystic and hepatic ducts run parallel for a long course.

Fig. 41. Injury which may arise to the hepatic duct when cystic duct winds around in front of it.

Fig. 42. Injury resulting to hepatic duct during effort to catch bleeding cystic artery.

frequently as the common duct if not more often. He has seen an accessory duct three times at operation during identification of the structures in the region of the cystic duct preparatory to clamping it. In one of his cases he saw bile coming from a cut open duct and thought he had divided the common bile duct, but on investigation this structure appeared to be intact. In order to strengthen his contention of the importance of these ducts to the surgeon, he went through the postmortem records of the cases dying after cholecystectomy at the Leeds' General Infirmary during the years 1908 to 1922, inclusive. During this period there were eight deaths due to bile leaking into the peritoneal cavity in considerable quantities. They were all cases of cholecystectomy without an accompanying choledochotomy. One of these deaths proved conclusively the importance of determining whether or not an accessory duct is present. The postmortem report was that there was present considerable bile in the abdomen; the gall-bladder had been removed and the ligature on the cystic duct was intact. Close to the liver but not in connection with the hepatic ducts proper there was an open bile duct and on squeezing bile exuded from it. In the other seven cases an extravasation of a considerable quantity of bile was noted, but the source not determined. He thinks that some, if not all of these cases had a divided accessory duct as in the previous case reported.

After cholecystectomy with drainage a small percentage of cases discharge bile from the wound though the cystic duct has been ligatured. This begins at once or a few hours after the operation, and is obviously bile from a duct. It has been attributed to bile from the raw surface of the gall-bladder bed; but it is too profuse for that and, moreover, is not mixed with blood as it should be from this source. The other explanation given is that the ligature has slipped off the cystic duct. This does not seem to be an adequate explanation, for the cystic duct is easy to tie and there is only a very low pressure behind the ligature. In view of what has been said above, a much more reasonable supposition is that of an injured accessory duct.

Though it is bad surgery to injure these ducts,

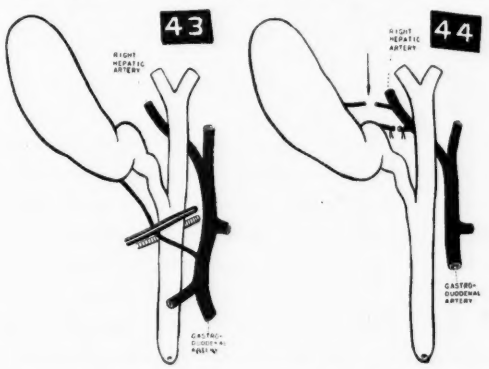

Fig. 43. Injury to the common duct during effort to catch anomalous bleeding cystic artery arising from the gastro-duodenal.

Fig. 44. Hemorrhage which may occur from an overlooked second cystic artery.

the probability is that little harm would result in the majority of cases, provided a dainage tube was left in. Many surgeons have advocated from time to time closure of the abdomen after cholecystectomy. Probably the fashion is more prevalent now than ever before. Some of these surgeons may not be aware of the possibility of the presence of accessory ducts, as the subject has never been raised in this connection, and closure of the abdomen with one of these ducts cut would be a disaster. Such an accident would in all probability be explained as leak from the cystic duct. To this the argument might be advanced by those who favor closure, that bile would be seen to flow from the open end of the duct during the operation and that the application of a ligature would make it safe to complete the abdominal closure. But this does not necessarily follow, for it is well known that after putting a tube in the common duct not a single drop of bile may appear sometimes for twenty-four or thirty-eight hours. Though this is not likely to happen after cholecystectomy alone, there is no doubt that in those cases associated with much hepatitis the secretion of the bile is more or less temporarily suspended. Moreover there is no objection of any moment to leaving a piece of rubber drain for one or two days through an incision which displaced the rectus outward. A hernia very seldom results, and it will save a life now and again.

Two interesting questions arise to which no definite answer can be given as yet:

1. What happens to that part of the liver drained by one of these ducts after a ligature has been applied?

2. What becomes of the duct if it be divided and left open?

As to the first question, only a limited part of the liver drains into this duct and one would expect a healthy organ would be able to compensate in its other parts, for the capacity of the liver cells to multiply in accordance with necessity is equaled by no other organ in the body. Flint performed an experiment with the object of finding out whether bile cut off in one part of the liver could make its way round to another. He ligatured the common duct low down, and also the cystic and left hepatic ducts. He then injected methylene blue in the upper part of the common duct; the only way into the liver was up the right hepatic duct and yet bile appeared in both the right and left lobes. It is already known that bile can make its way from one group of liver cells to another in the immediate neighborhood.

Suppose that one of these accessory ducts was ligatured when the liver was not healthy, as, for instance, in a case of prolonged obstruction to the common duct. In such a case temporary suppression of bile is known to be not uncommon after operation, and it is quite possible that extra work thrown suddenly on the damaged liver, as would be the case after ligaturing a fairly large accessory duct, might cause a total suppression.

As to the second question, probably the open duct gradually closes as a result of the cicatricial changes in the area operated on, and the bile may subsequently find its way round to other parts of the liver, or possibly this part of the liver undergoes cirrhotic changes.

Though quite a large number of injuries to the bile ducts have been collected and reported by various writers, notably Eisendrath and Elliott, these probably only represent a small fraction of the total number of injuries that have been inflicted, for surgeons are ashamed of committing such errors, and rightly so, and do not feel disposed to advertise them. So long as surgeons continue to clamp and ligate structures in this region *en masse*, catastrophes are certain to occur. This can only be avoided by seeing everything and being familiar with all the abnormalities.

SUMMARY

Every surgeon should be familiar with the following anomalies:

1. The gall-bladder may be (a) absent, rudimentary or hour-glass; (b) it may lie more or less completely enveloped by the liver (intrahepatic form); (c) the pelvis may be on the upper instead of the lower side; (d) right hepatic duct may empty in the gall-bladder; (e) there may be transposition of the viscera.

2. The cystic duct may be (a) double, i. e. there may be two cystic ducts; (b) an accessory hepatic duct may empty into either the cystic or the angle of junction of the cystic and main hepatic ducts; (c) the cystic duct may

be so greatly dilated as to be almost indistinguishable from the main hepatic duct; (d) the cystic duct may be very small and extremely short.

3. The hepatic ducts, (a) there may be accessory hepatic ducts.

4. The common duct may be (a) extremely short or very long; (b) a double common duct may be present; (c) in nearly sixty per cent. of individuals the common duct passes through the head of the pancreas.

5. The blood vessels. (a) There may be anomalies of the right hepatic artery; (b) of the single cystic artery; (c) of the double cystic arteries; (d) of the gastroduodenal artery.

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I will demonstrate a forceps that I have devised for this work of ours that has stood me in very good stead, and that is to do away with the hands of the assistant during the operation. I have devised these forceps to grasp the liver in this way, and hold it up so that you can get at the various bile tracts. Dr. Williams kindly got this liver for me in order to demonstrate the forcepts. They do no harm at all to the liver substance, but it does away with the hands of the assistant lifting up the liver.

In conjunction with that, I am using the reverse Trendelenberg position, that is get the patient up almost in the goiter position, an angle of 45 degrees, which allows of the heavy liver on the suspensory ligament coming down, at the same time the abdominal viscera fall away from the field of operation. It has stood me in very good stead.

I wanted to report to you in this connection, here is a most interesting case that I had lately. This is rather a unique case:

Mrs. H. B., aged 46 years. Mother of four children. Admitted to the Michael Reese Hospital, suffering with acute abdominal pains, especially in the left upper quadrant. Pulse 140; thready temperature 101; white count 20,000; 70 per cent. polymorphonuclears. Palpation reveals a mass in the left upper quadrant; on percussion and auscultation it was found that normal liver dullness was present on the left instead of the right side and a tympanitic percussion sound was elicited over the right upper quadrant.

The apex beat corresponded to the fifth interspace on the right. The diagnosis was that of a situs inversus viscerum and was made with an acute empyema of a left-sided gall-bladder.

The desperate condition of the patient precluded immediate operation and for two hours she was treated by means of intravenous, glucose saline solution. Then under ethylene anaesthesia a left-sided midrectus incision was made and the gall-bladder was found lying on the left upper quadrant. The stomach in the right upper quadrant and on bringing up the cecum to inspect the appendix it was found in the left iliac fossa.

Due to the desperate condition of the patient, the gall-bladder was simply drained, the same containing a large quantity of pus, but no stones, the serous surface was covered with a pyogenic membrane.

The patient made an uneventful recovery.

DISCUSSION

Dr. R. W. Viehe, Evansville, Ind.: I am sure we all appreciate the paper that Dr. Friend has come to give us. I think he has very clearly brought out to us who are doing gall-bladder surgery, that we are not only dealing with the pathological condition but, in a very large percentage of cases, we are dealing with abnormal conditions. There is a very small percentage of cases in which the ducts and vessels are entirely normal.

As to the point of the right hepatic vessel which he showed in one diagram, arising low and curling over the front of the common duct, this condition was described by Moynihan. I think he describes it this way: If you pick up the gall-bladder and put the cystic duct on the stretch, the large vessel sometimes has a hump there similar to the hump, as he calls it, of the caterpillar in motion. The presence of that hump should put us on guard, as we are probably dealing with an anomalous hepatic artery. One can realize what danger or what damage was added by ligating the right hepatic artery which is supplying the liver cells, which are already damaged by disease.

The accessory ducts, as he showed you, are formed in a considerable number of cases. Anyone who has done gall-bladder surgery, after ligating the cystic duct, and leaving the patient in good condition, free from drainage at the time of operation, then comes back in the evening or the next morning and finds it accentuated with bile, will probably account for the curling of the accessory ducts. The injury to the accessory ducts is not so serious in the end results, except they prolong drainage, and, to my mind, clearly emphasize the fact of always draining ball-bladder cases. I believe there are some men today who will remove a gall-bladder and close the abdomen without draining. I always drain in gall-bladder cases.

I had the pleasure a few years ago in Chicago of attending the A. M. A. meeting, I think it was, and saw Dr. Friend demonstrate this same clamp. I took advantage of it and have been using the clamp and, too, have found it of great help in exposing the undersurface of the liver. I have never seen it tear or do any damage to the liver. I might also add that I was very fortunate not long ago to have a young man in

the hospital who had a transposition of the viscera.

Dr. Emanuel Friend, Chicago, Ill.: As I said before, I am very thankful to be able to bring this subject before you. If I had continued to finish this paper, I would have brought out one important point that Dr. Viehe spoke about, and that is there is not such great harm in cutting accessory ducts if you drain. Ultimately you have from the reaction, agglutination of those ducts, and they do not create any trouble by cutting, if you drain.

I believe as he does, and have carried it out in my practice, never close an abdomen after cholesystostomy. I generally insert a Bullet drain. This is named after an army surgeon, Dr. Bullet. This lies up against the raw surface. It would be rather egotistical if I mentioned the results that we have in our cases of all kinds, and the records will show it.

In taking this subject up with Dr. Moskowitz of Mt. Sinai Hospital, New York, he asked me whether a number of the Chicago men do close the abdomen. He said, "Well, that is just my idea. I have grown to an age where I want to sleep at night, and I drain every one of them." That is not alone for a cut accessory duct but from the spilling of bile or infectious material in the abdomen. Understand me right, the average bile is not infectious unless it is contaminated by means of pus. I don't remember ever losing a patient from peritonitis in gall-bladder work. I have drained every one of them. I will pass this about. It is just a piece of gauze with a piece of gutta-percha. He sounded the keynote, to drain those cases, and you are much safer.

5 North Wabash Ave.

SENILE CATARACT SIMPLIFIED FACOERISIS*

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It is generally conceded that a senile cataract removed within its capsule requires more skill than the capsulotomy operation, but lessens the patient's stay in the hospital, eliminates secondary operations, and produces better results, providing the operation can be performed with no complications other than those of the capsulotomy operation.

Vitreous loss seems to be the principal objection to all methods of operating for cataract, and especially all intracapsular methods; but, if the intracapsular operation is understood, and its technique properly followed, there is but little vitreous loss and burst capsule would be the main reason of disapproval. Intracapsular operators report about ten per cent of ruptured capsules which are classed by them as complications, but if this is a complication, then the capsulotomy operators must admit one hundred per cent of complications from this source.

Some definite procedure that is not dangerous to the patient will naturally result from the various intracapsular methods having good points which can be performed successfully by average operators.

Preparation of the Patient: If the lids, sac, pupil, tension and smear are negative, a general examination is made which includes examination of urine, blood sugar and blood pressure. If the blood pressure is over 150, it is well to draw off ten ounces of blood from a vein one hour before operating. Three or four drops of a two per cent. solution of homatropin or an ointment of five per cent. euphthalminae, and five per cent. cocaine is instilled into the eye every forty-five minutes until full dilation is obtained, one or two applications usually being sufficient. Before cleaning the face for operation, a few drops of a five per cent. solution of cocaine is instilled into each eye, and, after four minutes, the face, brow and lashes are washed with soap and water; then with alcohol. The brow, lashes, lids, and the skin for two inches around the eye, are painted with five per cent. solution of iodine.

The injection of five cc of two per cent. of novocain solution is made ten or more minutes before operating (Fig. 1). Added to this ten

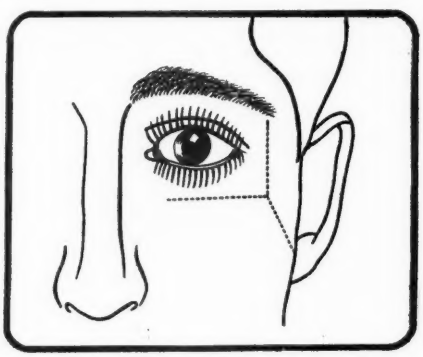

Fig. 1. Method of procedure in three injections of 5cc of two per cent. novocain in order to effect complete relaxation of the orbicularis palpebrarum.

*Read before the Section on Eye, Ear, Nose and Throat, Illinois State Medical Society, Peoria, May 22, 1929.

drops are injected under the skin at the inner side of the nose. Pain is sometimes complained of from the injection, but this is lessened if a very small, sharp needle is used, first injecting superficially a small amount; then, after three or four minutes, the deep injection is finished

Fig. 2. Author's upper lid hook.

with a large, long needle, injecting the solution as the needle is slowly withdrawn. The injection of novocain is imperative because it is difficult to know how a patient will perform when operated upon. A few drops of a five per cent. solution of cocaine is instilled into the eye every four minutes for four or five times, or until anesthesia is complete.

If the operator has reason to believe the patient will not fully co-operate it is well to do a canthoplasty and insert a suture to be tied when the cataract operation is finished. It is also advisable in such a case to inject five drops of a four per cent. solution of cocaine deep in the orbital cavity above, and ten drops of a two per cent. novocain solution deep in the orbital

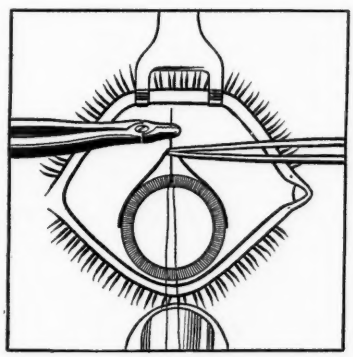

Fig. 3. Pupil is fully dilated, the incision is made and conjunctival suture placed.

cavity below, before beginning the operation. If these precautions are taken, general anesthesia will scarcely ever be necessary.

The Operation: A skin suture is placed in the upper and lower lid to be tied when the operation is finished.

A white silk suture is passed through the superior rectus muscle and given to the assistant to hold along with the upper lid hook. This suture is often used to pull the eye down when clearing the eye of debris and making the toilet.

The upper lid is held by a nurse or assistant,

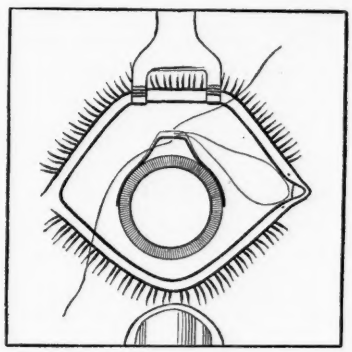

Fig. 4. The untied thread is looped at the inner canthus where it will not interfere with lens delivery. The pupil is fully dilated.

with an upper lid hook (Fig. 2). The lower lid is held by the thumb. The eye is flushed with six ounces of warm bichloride of mercury solution, 1 to 5,000, and the excess removed with a sterile medicine dropper.

The Incision: The incision should be just a

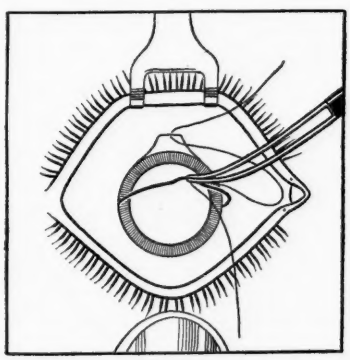

Fig. 5. The conjunctival flap is held up with fine forceps. The erisifaco can be readily applied to the lens without looking through the cornea. The pupil is fully dilated.

little less than one-half of the cornea, terminating in a conjunctival flap.

Conjunctival Suture: A suture is placed in the conjunctival flap (Fig. 3). The thread is

looped at the inner canthus to allow escape of the lens (Fig. 4).

The operator turns down the conjunctival flap with delicate forceps (Fig. 5) and places

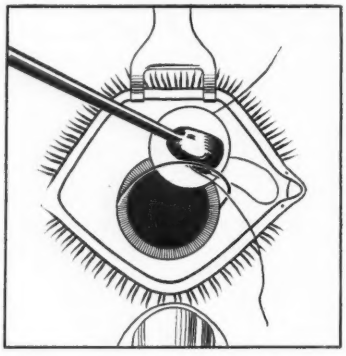

Fig. 6. The lens is delivered slowly passing over the edge of the fully dilated pupil. The thread loop is seen in the inner canthus.

the sterilized erisifaco directly and evenly upon the lens, and without the slightest pressure upon the lens, presses the button of the erisifaco. After counting seven, or about seven seconds, the erisifaco will be firmly adherent to the lens and the extraction is made by raising the lens up and out top side first, not tumbling (Fig. 6).

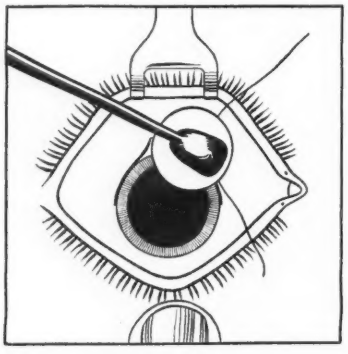

Fig. 7. The lens is delivered, and while adhering to the suction cup, is placed over the conjunctival flap, rubbing it gently which straightens out the flap, and pulling the top end of the thread, straightens out the loop. The pupil is fully dilated.

Slight pressure upon the cornea below is made when the lens refuses to be born.

When the lens is out and adhering to the erisifaco, the corneal wound is gently rubbed with the lens to straighten out the conjunctival flap and at the same time the top end of the suture is pulled upon to straighten the loop (Fig. 7). When the suture is tied, the pupil will usually be found contracted and peripheral iridectomy

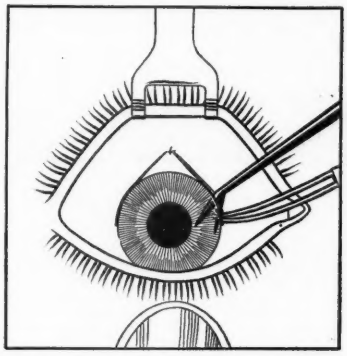

Fig. 8. The conjunctival suture is tied. The Hess iris forceps is passed into the anterior chamber at the outer or inner angle of the wound, the iris grasped and cut within the anterior chamber with Pasheff scissors. If the iris is pulled out of the wound a full iridectomy is liable to be made instead of peripheral. (Note the ease with which the peripheral iridectomy can be made on account of the contracted pupil after the conjunctival suture is tied.)

can be made at the puncture or counter puncture (Fig. 8). Should the pupil not contract, peripheral iridectomy may be omitted. The finished operation is pictured in Figure 9.

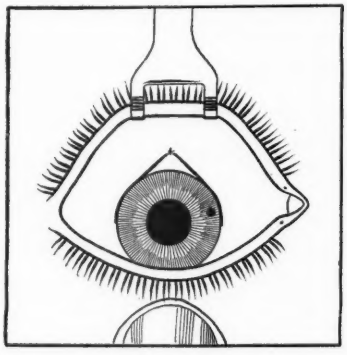

Fig. 9. Finished operation. The pupil is contracted, the conjunctival suture is seen at top and the peripheral iridectomy at side. Barraquer makes peripheral iridectomy in the same way at top before lens is delivered. Elschnig makes it in the same place with scissors, not using forceps.

Two or three drops of a two per cent. solution of eserin is instilled. Five per cent. solution of iodine is applied to the wound with a cotton carrier, the superior rectus suture is removed,

and the lid suture is loosely tied. Yellow oxide of mercury ointment from a tube is applied to the lids and the eyes bandaged. The lid suture is removed after twenty-four hours.

Technique: To successfully remove cataracts by facoerisis, or by other methods, requires much experience. Six-weeks-old kitten's eyes offer good practice for making the incision and peripheral iridectomy.

Inserting and tying the conjunctival suture and for practicing facoerisis with chicken lenses see Figure 10.

The steps in simplified facoerisis technique will be easily followed by the accompanying illustrations:

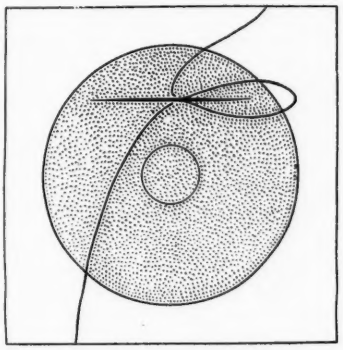

Fig. 10. Represents a method of practicing facoerisis.

The end of a large spool is covered with black cloth and a round hole is made in the center. A piece of transparent cloth is placed over the black with a slit to represent the incision. A thread is inserted to represent a conjunctival suture and looped for exit of lens. The hole in the spool is filled with cotton to within 1/16th inch of the top. On top of the cotton is placed the lens of a freshly killed chicken.

The edge of the incision is picked up with fine forceps, exposing the lens and the erisifaco is placed evenly upon the lens. Without using any pressure the button of the erisifaco is pressed upon. This position is held while the operator counts seven, or about seven seconds.

The lens is lifted slowly, or drawn up and out. When the lens is out and adhering to the erisifaco, the lens is placed upon the incision, gently rubbing it which straightens the conjunctival flap and the upper end of the suture is pulled which straightens the loop. The suture is then tied, using forceps.

Complications: A poor incision, blood in the anterior chamber that cannot be removed, cutting the iris while making the incision, or a nervous patient, warrants an operator in changing from a new procedure to one he is in the habit of doing. If the erisifaco slips, the zonula will probably be broken and the lens can be removed by the Smith or Knapp method as a tumbler.

If vitreous loss occur before the lens is delivered, a full iridectomy is made and the lens is removed with a Smith spoon, the conjunctival suture is tied, and the toilet made.

If vitreous loss occur after the delivery of the lens, the conjunctival suture is tied and any tags of vitreous that are in the wound are cut off with scissors.

If the capsule is ruptured, the lens is removed and the conjunctival suture tied after which the eye is cleared of lens matter. Two per cent. atropin is instilled after any complication.

After Care: The unoperated eye is made free the second day and the patient allowed to be up. There is no good reason for inspecting the eye for three or four days, but the danger of early and frequent dressing is lessened by the use of the conjunctival suture. Uncomplicated cases do not usually require treatment and at the end of a week, the bandage can usually be omitted and dark glasses substituted.

Pain: An enema, two live leeches to the temple, ten grains of aspirin together with one grain of blue mass T. I. D., as recommended by Smith, will probably be more effective than treatment with eye drops; however, atropin is often indicated but should be used cautiously.

Blood Injection: If vitreous loss or ruptured capsule occur, a blood injection is given the following day, as follows: Fifteen cc of the patient's blood is drawn from a vein, placed in a sterile test tube for 45 minutes; then stirred with a sterile glass rod; let stand five minutes; draw off 5 cc of serum and inject into a muscle. Every three days for three more injections, 15 cc of blood is removed from a vein in the same way and injected into a muscle at once before clotting. The object of this autohemotherapy, which is also effective in the treatment of sympathetic inflammation, is to prevent the development of post operative inflammation.

FACOERISIS

(Barraquer)

Pupil dilated but not too wide for peripheral iridectomy.
Peripheral iridectomy is made before lens delivery.
Erisifaco passed under cornea and placed upon the lens.
Lens tumbled and brought out bottom side first.
Peripheral iridectomy above before lens delivery.

FACOERISIS

(Simplified)

Pupil too wide for peripheral iridectomy. (Fig. 3).

Peripheral iridectomy is made after lens delivery. (Fig. 8).

Corneal flap pulled down exposing lens for placing erisifaco. (Fig. 5).

Lens brought out top side first, over the fully dilated pupil. (Fig. 6).

Peripheral iridectomy at puncture or counter puncture after lens delivery and the conjunctival suture is tied. (Fig. 9).

CONCLUSIONS:

The well-dilated pupil, complete anesthesia, the employment of lid hooks, raising the conjunctival flap and thereby exposing the lens, facilitates placing the erisifaco evenly upon the lens, without catching the iris, which is all-important. Lifting the lens slowly up and out will appeal to many. When the lens is out and the conjunctival suture is tied, the pupil usually contracts and peripheral iridectomy at puncture or counter puncture is readily made. The percentage of complications at time of operation will be reduced to a minimum, and when performed without complications there is no secondary operation and post operative complications are rare, the best possible vision is obtained, and the time in the hospital is greatly reduced. Last and best of all, the operation can be performed when the patient is unable to do that which he is called upon to do.

231 W. Washington St.

DISCUSSION

Dr. Carson K. Gabriel, Quincy, Ill.: If a method can be devised so that the lens can be removed within its capsule as safely as by the extra-capsular methods now employed, this method is ideal. I think that cortical substance remaining in the anterior chamber after operation is a distinct menace to the eye. In a number of cases in which we have used the Barraquer method, our results have been very satisfactory. We have used a different method of injecting for producing akinesis. The temporal facial branch of the seventh cranial nerve is injected. This branch is located by palpating over the temporal mandibular articulation while the patient opens and closes the mouth and then with the mouth closed a needle is inserted down to the condyle of the mandible. Two cubic centimeters of novocain is then injected, slowly withdrawing the needle while injecting. This produces complete paralysis of the muscles concerned in forced lid closure. There is a pronounced disadvantage to this complete paralysis in that the eye has a tendency to remain open. For this reason one should use extreme care in keeping the lids closed while bandaging the eye. Dr. Fisher overcomes this difficulty by using a lid suture. We tie a knot in the distal end of the conjunctival suture before inserting; the suture is passed through the flap first and then the bulbar conjunctiva. It is then unnecessary to use a forceps in turning the flap down when placing the erisifaco on the lens; simply lift the flap with the suture; the knot prevents it from passing through the conjunctival flap. In most of the cases I have seen, the pupil did not contract after the lens had been removed, and in all but two cases, it was absolutely impossible to perform a peripheral iridectomy. I think that in trying to perform this iridectomy after removal of the lens there is a distinct danger in rupturing the hyaloid membrane and causing vitreous loss.

Dr. C. Hopkins Long, Chicago: I do not know much about this operation, but I observed Dr. Fisher do it about three weeks ago and was very much struck with the technique and the beautiful toilet he made after the operation.

Dr. E. V. L. Brown, Chicago: We have been using morphin for anesthesia in this way; one-eighth grain with scopolamin 1-160 grain the night before, to learn if the patient has any tendency to vomit. Next day three-quarters of an hour before operation, we repeat the injection. The patient has no pain. Will Dr. Fisher please tell us about how many cases he has operated on by this method.

Dr. George Francis Suker, Chicago: For many years I have used scopolamin and morphin and found it useful. I would not advise anyone using morphin alone on account of the nausea caused. Scopolamin 1/150 grain and 1/6 grain morphin given one hour before operation produces a calm in the patient which is very helpful. In giving a general anesthetic in adult, we give two injections of the above, one two hours and a second one hour prior to hour of operation. The patient does not have the uncomfortable recovery from the anesthesia—nor is very much ether needed in producing a profound and continue anesthesia.

Dr. William A. Fisher, Chicago (closing): The only trouble Dr. Gabriel seems to have had is that the pupil will not contract in order that he can do a peripheral iridectomy. If atropin is used the pupil will not readily contract and should not be used. If homatropin is used 4 or 5 drops are instilled into the eye 45 minutes before the operation and repeated if the pupil is not dilated, or an ointment of per cent. cocain with 5 per cent. euphthalminae is inserted between the lids 45 minutes before the operation and repeated if the pupil is not dilated. The eye is kept closed while being dilated. If the pupil is made too large it will not contract, and peripheral iridectomy would be difficult.

Dr. Brown asked how many cases I have done. I have been operating by the method described for eighteen months, and I have had very few complications. I do not give morphin because I do not like to use it. I do not think it does a patient any good. I do not give medicine of any kind before a cataract operation, because I have no trouble without it. Novocain is perfectly satisfactory if properly injected.

IMPRESSIONS BY THE RETIRING PRESIDENT OF THE CHICAGO MEDICAL SOCIETY

FRANK R. MORTON, M. D.

CHICAGO

It is difficult to say whether I am glad or sorry that my term of office comes to a close. I do know that during my term as president-elect and as president many subjects of vital importance have come up for discussion and action by the officers and the Council. Some of them I feel were of great importance not only to medical men in Chicago, but to the profession all over the country.

From what I have learned in talking with physicians from various parts of the country, I want to assure you that the eyes of the medical profession today are turned upon the Chicago Medical Society. They feel we must maintain a firm stand and uphold the traditions which have been built up through years of service in the practice of medicine, not only for the public good, but for the professional good; that we must not let outside interests turn us from our viewpoint; that medicine is not a business but a profession and cannot be considered as a commerical undertaking. In short we have a responsibility to the medical profession at large, as well as a continuing responsibility to ourselves.

The record of the Chicago Medical Society during the last few years has been one of continued improvement. You all know we are the largest local medical society in the world. Our membership has increased from 3600 to over 4300 during the last four years. Our financial resources have increased gradually, and our surplus is invested in sound securities. We have been fortunate in having a capable, energetic and active board of trustees. We know our general offices are conducted in an up-to-date business manner. Our resources are limited, however, by the amount of dues. Expansion of activities rests in large measure on an increased revenue from this source. No society receives so much for so little outlay as does this one. As a parting suggestion, I would urge a substantial increase in dues to provide funds for the growth of the Society.

We are ever ready and anxious to be of service to any and all of our members. The various committees of the Society are organized to do the work assigned them in a thorough and useful way. In spite of irresponsible rumor and even printed comment that the profession in Chicago has been disorganized and the Society split in half, we are proud to say that during the last few months we have had only three resignations and during this same period more than 100 new applications. We feel that the profession in Chicago, particularly the members of our Society, are more in unison and believe more firmly in the ethical practice of medicine than ever before. We now have a more unified fellowship and cooperation among our members than at any time in the past twenty years. All but one of the important local medical societies are now affiliated with the Chicago Medical Society.

We enjoy active co-operation and close relationship with the city, county and state departments of health. We have no misunderstanding with any real charitable organization in Cook County. This includes all social and welfare agencies. We have agreements as to the conduct of the hospitals and dispensaries of the University of Chicago and the University of Illinois. We know we have the active co-operation and good will of the medical departments of Northwestern University and Loyola University.

We enjoy the distinction of being the first local medical society to employ a full time executive secretary. Your officers and board of trustees, even after the short experience of six months, feel that this is one of the most important and progressive steps the Society has ever taken. We have been fortunate in finding a man for this position who is a medical man, a member of our own organization who has had years of experience in health and social activities.

The Illinois State Medical Society, through expression by the officers of two important committees—the educational and the legislative, feels that in large measure the maintenance of the integrity of the profession in this state during the last few years has been due to the wholehearted co-operation of the members of the Chicago Medical Society. This co-operation has been given in advancing the scientific aspects of medicine among down-state societies, luncheon clubs, and similar civic bodies.

Two years ago we faced a very serious situation in an organized movement directed at physicians and ostensibly started by them that had all the ear marks of being a racket. Later on we learned that if the organization succeeded there was a strong possibility the next move would be the unionization of medicine in this city. I know you will all agree that the success of this movement would have been a very serious blow, not only to the profession, but more so to the public. The activities of this new movement were stopped only by strenuous work on the part of the officers and the Council and of many active members with co-operation from the Employers' Association of Chicago. This menace is by no means a thing of the past. It is only waiting for a favorable opportunity again to become active. Free speech and freedom of action are inherent rights of the American people; but when the exercise of these rights calls into question the welfare of the community, they are restricted by law and should be restricted in fact. The activities of those who jeopardize the future of medicine by suggesting the strong-arm methods of the racketeer must be watched, and, wherever and whenever they come into evidence, vigorously frustrated.

During my term of office two situations have arisen in which the Medical Society had the co-operation of other civic bodies in a most helpful way. An attempt was made to establish a branch dispensary for the Chicago Lying-In Hospital in the South Chicago district. A survey among the industries in that vicinity showed that little assistance of the kind contemplated was needed. The facts in the case were placed before the South Chicago Chamber of Commerce which promptly went on record as opposed to the establishment of such a dispensary in the community, thereby effectively disposing of that situation.

More recently in the Northwest district campaigns were inaugurated for the collection of a large endowment for one of the hospitals. This drive had the endorsement of the Association of Commerce; but when it was brought to the attention of the Association that a portion of this endowment was to be used for the establishment of a free clinic at this hospital, prompt action by the Association in co-operation with the work done by the Northwest branch caused a sudden and complete abandonment of the plans of this hospital so far as they pertain to the clinic.

Commercialization of Medicine

Articles appearing in print during the last few months, following the expulsion of a member of our Society for violation of our code of ethics, and the quoted comments of certain individuals conspicuous in the public eye, leads one to believe there is a determined movement on foot to commercialize medicine. Commercialized medicine, in my opinion, is the practice of medicine on a merchandising basis made possible through advertising campaigns designed primarily for the purpose of attracting and treating patients in large numbers by so-called standardized methods. The plea of those who advocate the treatment of patients en masse is that medical costs are lowered. By studying a famous institute operating in the city of Chicago one can learn that the main object of this institute is to treat an ever-increasing number of patients. Scientific treatment has found no place in that organization. The public has somehow been led to believe that this institute advertises from an educational standpoint only, and that it is necessary to guide the public mind along the lines of their specialty; that it is a charitable organization, entitled to special and favorable consideration; whereas, in fact, the advertising is of a commonly familiar commercial character, and the organization itself is one of the leading money makers offering biological service to the public. The charter calls it a non-profit organization. This is literally true if earnings transferred to surplus are not profits, and if present prices by permitting a surplus are not too high. And to make this institute appear as a public-spirited organization, it has made contributions to hospitals and universities for research work. After a thorough study of this institution we are of the opinion that, if all the branches of medicine were practised along the same lines in Chicago, or elsewhere in this country, there would soon be a break-down of scientific progress. Medicine should not and cannot be scientifically practised in this manner.

We have been advised in print that the code of ethics of the medical profession should be changed to conform to modern ideas, particularly modern business ideas. Such evidence seems to proceed from two errors—first, that doctors are reactionaries by nature of their profession—and second, that medicine is a mechanical art. Our advisers mean well. Their thinking is at fault,

If this profession lets down one iota in its ethics, which are based solely on admitted moral precepts, and if we accept even in a small way commercialism, with the merchandising type of advertising as a drawing card for patients, it will be the downfall of a great profession, and the public will be the greatest sufferer.

It has been clearly shown—too often for fresh proof here—that 90 per cent of sick people are best taken care of by their family physician, who knows about their habits, family and personal history and other elements entering into the cause of sickness. This intimate knowledge can be obtained only by physicians who have a close personal contact with their patients. Mass treatment of patients by standardized methods will never take the place of a personal service by the experienced type of general practitioners who are now being graduated from the large medical colleges in this country.

Medical care has always been given regardless of the financial status of the sick person. No true physician refuses help to those in need of it. Physicians have asked only that they be treated fairly; that the sick pay only what they are financially able to pay, and this should be charged accordingly to the earning capacity of the public. Those unable to pay should and must receive medical care. That they do receive it from physicians is too obvious for comment. Students starting on a medical career do not do so with the thought that they are going into a commercial business but that they are preparing to render service to humanity; that any financial returns are only a secondary objective in their life work. A study of the history of outstanding medical men, possibly a study of the income tax returns of this country, will prove that medicine alone has never been the producer of even moderate fortunes or incomes. I doubt very much whether a large percentage of physicians have become even financially independent through the earnings of their practice.

When we remember that during the past seven years this country has enjoyed the greatest prosperity in the history of the world, we wonder why the charity budget for Chicago has increased from eight million dollars to twenty-five million dollars, the amount spent last year. Talk about the high cost of being sick, how about the high cost of charity? And we wonder what the public would think and say if there were added to this staggering bill for charity the millions of dollars in free or partial cost service which the doctors of Chicago and Cook County give quietly every year to the needy or the financially embarrassed people of this community! Suppose the public and Chicago business had to shoulder a tax burden for these millions which the doctors quietly contribute?

I feel that the medical profession, not only in Chicago, but all over the country, is facing a real crisis. The question is: shall we let down the bars on our ethics and on our standards of practice? Whatever we do will affect our profession the country over. We have an opportunity and an obligation to affect favorably the practice of medicine. Should we falter, there is much to be lost. To carry on effectively, the assistance of all our members is essential. No group can afford to sit by and say that passing events have no interest for them. Regardless of the position they have reached in their chosen specialty, they still owe a duty to the profession to see that conditions inimical to its welfare are not imposed by outside forces acting for personal gain or publicity. Medical schools are also vitally concerned in the problem that now agitates the profession, and unless they are willing to support the fight against the encroachment of ulterior forces in the field of medicine, it will be useless for them to turn out high class, capable, young physicians, if after a few years these same physicians must compromise their ideals and accept the viewpoint of forces now destructive to true medical progress.

I want, finally, to thank the officers, the councilors, and the various branch officials for their complete and ever ready assistance which I have always had, not only as secretary, but as president-elect and as president.

THE ANATOMY AND PHYSIOLOGY OF THE NORMAL SPINE AND PELVIS*

E. J. Carey, M. D.

MILWAUKEE, WISCONSIN

There is no question but that the normal anatomy and physiology of the spine is becoming increasingly important, due to automobile in-

*Read before Radiological Section of Illinois State Medical Society, May 8, 1928.

juries and insistence on the exact knowledge by industrial commissions and insurance companies.

The spinal column acts as a protecting case for the central nervous system. It is approximately, on the average, seventy centimeters in length in the male and in the female approximately two and five-tenths to three centimeters less.

The spinal column is arranged in a series of elements with the bodies ventrally and the arch portion dorsally placed. This particular series of bony elements in the cervical region approximates one-sixth of the entire length of the spinal column. In the thoracic region, it is approximately one-half the entire length and in the lumbar region approximately one-fourth. Of this entire series of vertebrae in the cervical, thoracic, lumbar and sacral region, one-fourth of the entire length is made up of the intervertebral discs, or cushions that act as buffers in the transmission of body weight through muscle action.

In the series of curves we find in the spinal column, when we look at it in profile view, four in number. In the cervical region, the curve has its convexity direct toward the front. In the chest region, the convexity is directed dorsad, and in the lumbar region the curve is directed toward the front as convexity. In the sacral or pelvic region, we find the curve directed toward the front as a concavity, so we have the alternating convex-concave arrangement, which gives greater elasticity in the transmission of body weight, and, at the same time, gives greater stability and support.

A curved column with four series of curves, as we find it, is approximately sixteen times stronger than if it were one single straight line made up of the series of elements as we find them. The movements that are capable of being made in the spinal column are variable in different parts of the region. The four main movements are ventral flexion, dorsal extension, lateral flexion, or abduction from the median line and torsion around a vertical axis.

In the cervical region, we find flexion and extension are capable of being executed rather easily in degree; whereas abduction or lateral flexions to the left or right are limited. The rotation is capable of being freely made in the cervical region; whereas in the thoracic region there is marked limitation of movement in the ventral and dorsal direction. In other words, flexion and extension are extremely limited; whereas lateral movement is more freely executed than ventral flexion or dorsal extension. Rotation in the thoracic region is capable of being executed more freely than in the lumbar region; whereas in the lumbar region the four types of movement, ventral flexion, dorsal extension, laterally to the left and to the right, are more easily made than in any other region of the spinal column. Rotation, however, is slightly limited over that found in the thoracic region.

One of the reasons I go into detail in regard to the various movements is to emphasize the structure of the vertebrae. At the present time the majority of anatomists look upon the cancellus bone in the body of the vertebrae as being laid down due to the static pressure of body weight in the upright position. As we look at the various sections of the radiograms thrown on the screen, I want you to keep in mind the various degrees of mobility in the different parts of the spine.

In the new-born, we find that we do not have these four groups of curves that I mentioned. At about the third month infants are able to flex the head. You will find that the cervical curve with its convexity ventrally is developed, whereas the lumbar curve does not begin to develop until the child is capable of walking or standing in the upright position, at along about the twelfth to the fourteenth month.

(Slides.)

The slides illustrate the structure of cancellous bone in bodies of the vertebrae correlated to the movements executed and the back pressure vectors produced in the vertebral bodies by group muscle pull.

PREGNANCY AND LABOR IN WOMAN SUFFERING FROM GENERAL PARALYSIS

B. LEMCHEN, M. D.
Chicago State Hospital
DUNNING, ILL.

The medical literature is meager on pregnancies in women suffering from general paralysis. The textbooks do not mention it.

In my experience of 19 years on the resident

staffs of various hospitals, of which 17 are insane hospitals, only two pregnancies in a general paralytic woman came under my observation. One was a miscarriage of a death fetus of about 5 months pregnancy and this is the second case—where I delivered a living and apparently normal child. The treatment the mother received unquestionably had a good deal to do with it. I think the case is rare enough to be reported. It is as follows:

Lydia D. Was admitted to the Chicago State Hospital, February 17, 1927. She was 35 years old and born in Norway. At the time of her admission she was pregnant.

History given by husband: Family negative. They were married in July, 1925. About 4 months after marriage patient had a miscarriage. She has been seclusive as long as the husband has known her. Over a month ago patient complained of a cold in her head, for which they consulted a physician. He diagnosed her case as sinus trouble and gave her treatment. After the second treatment he noticed that she was acting queerly. She complained of being choked up and of insomnia. She lost interest in her personal appearance and neglected her house. When friends visited her she would leave them and go to another room. She became mute and negativistic and would talk to herself in a monotone. She finally had to be committed.

History by a brother: Patient came to the United States from Norway ten years ago and did housework. She was married to a Syrian one and one-half years ago. The brother was against this marriage on account of the difference of religion and nationality. At the age of 25 she had a love affair and expected to marry, but the man turned her down. Her brother was told that she had a luetic infection and for a few months was confined in a hospital and received treatment. Her husband was told about it but he married her anyway.

History by a sister: Three years ago she had a nervous break down and the sister cared for her for eight months. She came home from work one day saying she was tired, ill, and complained of insomnia. She neglected her personal appearance and would sit and stare into space. There is no history of either visual or auditory hallucinosis at that time. Upon one occasion she said that she had nothing to live for but did not attempt to harm herself or others. She had one convulsion that lasted about five minutes. As far as the sister knows she has had no other.

The notes from the Social Service at the Psychopathic Hospital state that the patient was transferred from Ward 50 of the Cook County Hospital where she was admitted February 3, 1927. A diagnosis of Psychosis with Pregnancy was made. Her temperature ranged from 98.6 to 98.8. She has been irrational at times, uncooperative, and noisy. Wassermann was negative. Urine shows no pathological findings besides a few questionable casts. No symptoms referrable to her five months' pregnancy.

Notes from the Psychopathic Hospital state: She thinks that a brother has it in for her. She hears spirits talking to her. They tell her a lot of things. She frequently goes to a medium and sees the spirits. They are wonderful. She says she thinks she will be confined tomorrow.

When admitted to the Chicago State Hospital she was clear and oriented. Stated she was 35 years old and born in Norway. Attended school for seven years and after leaving school she did sewing and embroidering. She stated that she came to the United States eleven years ago. She has been married one and one-half years and believes to be seven months pregnant. She has been in good health except that she is having a little gas in the stomach. Her husband is a good man. Questioned about her commitment she states her husband sent her here because she was mean and did not give him any food for three days. States she heard the voices of spirits talking to her for five years. They always talked nice to her. She used to go to mediums but has decided not to go to them any more as she is a Methodist. She voluntarily states that she met a fellow eleven years ago who gave her syphilis and for several years she received treatment and was told that her blood was pure. His sister made him leave her millions of dollars for it and she wants to help her husband pay a second mortgage. Says her husband knew she had syphilis previous to her marriage. Says her husband never gave her any money. He only gave her $15 for food and that is the reason she had to go to the neighbors and ask for nickels when she wanted to phone. Says she suffered from headaches and dizziness. Lately she has not been bothered with those voices. She knows that she was in a hospital and asked the examiner the name of the hospital and if the patients here are crazy and if they can be cured. She laughs when asked if she thinks she is insane. States she does not believe there is anything wrong with her mind. She gave the date and also when she came here. She knew how many months there are in a year but not the number of days. She thinks there are 56 weeks in a year, could name the president, but not the governor. She could only do the smallest numbers in calculation. Stated she believes her husband from now on will be better to her and wants to go back to him. She will try and eat all she can when she gets back home as she has $90,000 which she knows she will get after she leaves here.

Physically she is fairly well nourished. There is a slight enlargement of the thyroid. Breathing was normal. Heart not enlarged, no murmurs. Blood pressure 90 systolic and 50 diastolic. Teeth in poor condition. Appetite good. There was a palpable asymmetrical globular mass in the abdomen, apparently about 6 months' pregnancy. Pain and tactile senses present. Recognized taste but not smell of the test

solutions. No tenderness on deep pressure. Coordination fair. Sways in Romberg position. Reflexes. Pupils react to light, accommodation, regular and equal. Superficial reflexes present, deep, are brisk. Organic intact and plantar normal.

Laboratory report: Urine analysis: specific gravity 1022; reaction acid; no albumin or sugar. Microscopical negative. Blood Wassermann negative. Spinal fluid 34 cells. Pandy Ross Jones and Nonneapelt 4 plus. Also Wassermann on the fluid gave a 4 plus reaction. Another examination of the fluid, which was made on February 28, 1927, gave 27 cells. Pandy, Ross Jones, and Nonne Apelt 4 plus. Lange's gold solution gave 5555554210. A diagnosis of general paralysis of the insane, cerebral type was made.

This lady was put on salvarsan treatment and received 0.6 gm. of neosalvarsan each on March 22, 1927; March 30, 1927; April 5, 1927; April 12, 1927, and April 27, 1927. Patient became more demented, would speak only occasionally and it was hard to state whether or not she was oriented. However, she often asked her husband to take her home. Apparently she recognized her husband and knew that she was not at home. She would smile often and seemed well satisfied.

This patient was kept on the Hospital Ward and watched closely on account of being pregnant. On May 8, 1927, at 11:30 A. M. without complaining of any labor pains or any indication of pain, while the patient was in bed, the membranes suddenly ruptured and in a few minutes a well formed baby boy was born. The placenta came about 30 minutes later. The placenta was thicker than normal and in places it had a kind of greyish tint. However, the entire placenta came without trouble. On examining the perineum it was found that it had a second degree laceration which was repaired and healed by first intention. Patient never had any elevation of temperature and in a couple of weeks was allowed to get up.

The baby weighed 8 pounds when born and was placed on artificial feeding. He took the nourishment well and was thriving. On May 25 the father of the baby took it and placed it with a cousin of his. It apparently is thriving well.

The mother also improved. She became oriented in all spheres, took interest in her surroundings, commenced to talk, and was finaly paroled to her husband, who reports that she is doing well. When seen about 5 months after delivery she was neatly dressed and carried on a fairly well connected conversation.

Blood Wassermann done on the baby on October 6, 1927, was negative. The baby weighed at that date 13 pounds. The mother had a relapse and had to be returned to the Chicago State Hospital. At present she is quite demented, shows considerable muscle tremor and speech defect, characteristic of general paralysis.

December 23, 1927, the baby weighed 17 pounds and 8 ounces and was doing well.

The interesting parts in the case are that the woman suffered from a psychosis with convulsions three years previous which in all probability was paresis, a good remission of three years duration without any treatment, a negative blood Wassermann with a positive spinal fluid test which is often the case in paresis, a diagnosis of psychosis with pregnancy which was made at the County Hospital, which is in keeping with views held by a good many physicians that paretic women do not become pregnant.

ABRUPTIO PLACENTAE

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The premature separation of the normally implanted placenta is a serious accident occasionally complicating pregnancy, and, because of its rarity, its possibility is often forgotten by the physician. It is well from time to time to recall the salient points of this and other unusual emergencies that they may not be overlooked. Every general practitioner should be prepared to recognize this tragic accident to the parturient woman; he is usually first to see the stricken patient; its early recognition and intelligent handling will save most of the maternal lives, whereas failure to recognize the condition will greatly jeopardize the mother and too often lead to her death.

Abruptio placentae is not of frequent occurrence, but reports from some large maternity hospitals give a surprisingly large number of cases. In a span of twelve months the writer has seen in consultation three patients with the tragic type of abruptio—two of them in the practice of one physician. Certainly every practitioner must be familiar with the outstanding symptoms and findings of this grave condition.

Clinically, abruptio falls into two types, the tragic and the non-tragic, with intermediate gradations.

Non-Tragic Types. The premature separation of the lower part of a normally implanted placenta is probably of fairly frequent occurrence, and accounts for many ante-partum hemorrhages, at or near term. (The hemorrhage from so-called "marginal placenta praevia" might very properly be classified under this group.) When this separation is marginal, especially if low, the blood easily courses between the fetal membranes and the uterine wall, and escapes at the cervix—

sometimes in alarmingly large amounts—but does not act, by accumulation, to further increase the separation unless the presenting part blocks the cervix. When the blood escapes, and does not accumulate, conditions are favorable for a normal cessation of the hemorrhage. Expectant treatment, without packing, is indicated, transfusing if necessary, and normal delivery can be expected to follow. But blocking the outlet with pack or bag converts it into the tragic type, unless a windless type of abdominal binder is jointly employed as noted later.

From the above considerations it should be borne in mind:

1. That ante-partum hemorrhage does not necessarily mean placenta praevia, although too often such is assumed to be the case.

2. Abdominal section for non-tragic abruptio is usually unnecessary and undesirable.

3. Packing for the hemorrhage of non-tragic abruptio does not check the hemorrhage (unless done according to the Dublin method) but merely conceals it, the accumulating blood causing progressive separation of the placenta, and a non-tragic abruptio is converted into a tragic abruptio.

4. Differential diagnosis is sometimes difficult if vaginal examination is alone relied upon as blood clot in the cervical canal has been frequently mistaken for placenta.

5. Incorrect diagnosis will lead to dangerous treatment.

Tragic Types. In tragic abruptio the treatment is radically different, and the prognosis far less favorable. When the separation and hemorrhage are central, or when the cervical outlet is blocked by the presenting part, or by ill-advised packing or bag, the accumulated blood acts to increase the separation; increasing separation maintains and increases the bleeding, and so the vicious cycle begins and progresses, and the situation takes on an alarming aspect that demands the maximum of judgment, skill and courage on the parts of the attendants.

Diagnosis. Non-tragic abruptio must be differentiated from placenta praevia, especially the central type; the presence or absence of placenta across the cervical outlet determines the diagnosis.

Frank tragic abruptio is readily recognized if the physician be only familiar with the condition. The woman at or near term quite suddenly develops severe uterine pain (not labor pains), the abdomen becomes rigid and increasely distended, the uterus is distended and uniformly tender, and within a few hours the patient is in shock; vaginal bleeding may be present or absent. The increasing distention of the tense and tender uterus is usually apparent but is better determined by caliper measurements from fixed bony points to the navel. The uterus exhibits tonic contraction without relaxation. When external hemorrhage is absent, pushing up the presenting part will sometimes afford a gush of blood. Shock becomes more profound, the pulse feebler and more rapid, and respirations fast and shallow.

Briefly, frank tragic abruptio placentae presents a picture of a surgical abdomen plus concealed hemorrhage in a woman at or near term and usually before the advent of labor. It needs only be differentiated from ruptured uterus—and the distended uterus of abruptio does occasionally rupture.

In ruptured uterus, many hours of severe labor usually precede shock and hemorrhage; often there is a history of Cesarean delivery. In ruptured uterus, the fetus can usually be felt outside the uterus, which is contracted, hard and relatively small, as contrasted with the enlarging, tender and uniform uterus of tragic abruptio.

In placenta praevia, the symptoms of surgical abdomen are lacking; hemorrhage is the first symptom; shock is a late symptom and follows an extreme loss of blood externally; abdominal pain is absent—excepting labor pains; the uterus is not tense, tender or distended; rigidity is lacking.

Etiology. Definite toxemia is evident in most patients with abruptio and is usually regarded as the most important predisposing cause; vascular changes lessen the cohesive properties of the placenta and favor premature separation. Violent uterine contractions, stimulated by blows on the abdomen or by violent muscular acts of the mother probably actually initiate the separation. Patients commonly trace the onset of the symptoms to recent external violence such as a fall or blow on the abdomen.

Treatment. Prophylaxis is suggested by a

consideration of the etiology: prenatal observation and regulation will probably do much to prevent this accident.

The milder types where hemorrhage is the only prominent symptom usually need no interference other than possible transfusions for excessive loss of blood. As long as the blood does not accumulate in the uterine cavity, there is little to fear for the mother and frequently a viable child is delivered. Packing or the insertion of a bag are dangerous as thereby the cervix is blocked, drainage is stopped, and blood accumulates in the uterine cavity, converting the case into the tragic type. Supplementing these questionable procedures with a tight abdominal binder of the Spanish windlass type and ample dosage of morphin are however the treatment of choice with some obstetricians.

In tragic abruptio, the treatment of choice is determined largely by the condition of the cervix:

1. Dilated cervix: Delivery by forceps or version and extraction can be accomplished; manual removal of the placenta should follow immediately. Shock will be aggravated by the sudden emptying of the distended uterus, and must be appropriately treated.

2. Effaced cervix without dilatation: Here again vaginal delivery is justifiable, although in urgent cases the prompter abdominal section may be wisely selected. If vaginal delivery is elected, the membranes are ruptured to reduce uterine distention and a tight abdominal binder applied that will encompass the entire abdomen. Manual dilatation or stellate incisions of the effaced cervix will permit version and extraction; the placenta is immediately removed and shock appropriately treated.

3. Uneffaced cervix: Two radically different procedures are in favor with different schools of obstetricians:

A. Cesarean section, either classical or cervical. If the uterine muscle and adnexa contain extensive extravasations, co-incident hysterectomy is advised by some authorities. It must be understood that section is performed wholly in the interests of the mother.

B. Dublin method. The patient is heavily narcotized; the cervix and vagina are tightly packed with pledgets of cotton soaked in some antiseptic solution; the greatest possible pressure is exerted on the uterus by combining a tight abdominal binder with a tight vulvar bandage. Uterine contractions are thereby inaugurated and stimulated, and hemorrhage is prevented. When the cervix is thought to be effected, the vaginal packing is removed; if effacement has resulted, manual dilatation is followed by version and extraction; if the cervix is not effaced, the vagina is repacked for an appropriate time. Immediate removal of the placenta and the treatment of shock are routine.

CASE REPORTS

Rose P. Italian housewife, 42 years old; para XII. Admitted to St. Francis Hospital, Blue Island, Ill., July 13, 1925, in shock. T. 98, P. 120, R. 44. Near term and suffering severe abdominal pain. No exact history was obtainable. The uterus was distended, tender and persistently contracted; no external hemorrhage; cervix uneffaced. Immediate Cesarsan section was advised, but refused by husband. Shock became progressively deeper. A Barnes bag was inserted and a tight abdominal binder applied. Patient died 11 hours after admission and 6 hours after insertion of bag, but before dilatation was accomplished. It is probable the woman's life would have been saved by a prompt Cesarean.

Lucian G. Italian housewife, age 24 years, para II. Admitted to St. Francis Hospital, Blue Island, Ill., Feb. 7, 1926. P. 100, T. 99, R. 22. Near term. Profuse sudden vaginal hemorrhage was followed by severe generalized abdominal pain. Uterus was very tender, persistently contracted, and apparently distended; cervix not effaced. Symptoms of shock developed within an hour of entrance to hospital (hemorrhage from vagina had stopped) and classical Cesarean performed three hours after admission. Peritoneal cavity contained many large clots; uterus was rotated clockwise with left broad ligament presenting in laparatomy wound; blood exuded from fimbriated ends of both tubes; extensive extravasations into broad ligaments and uterine muscle; uterus tense and distended. When uterus was incised, placenta floated out of wound (having become completely separated) in a great quantity of bloody fluid and clots; dead female fetus. Hysterectomy considered, but not performed. Uterus closed; abdomen closed without drainage. Patient ran a moderately septic course and left hospital on 20th day. Repeated urinary examinations evidenced chronic nephritis.

H. P. American housewife, age 24 years old, primipara. Entered Roseland Community Hospital, June 21, 1926, complaining of severe abdominal pain, and in moderate shock. She was 8 months' pregnant, and had exhibited pernicious vomiting in the first 3 months, and pyelitis and nephritis throughout the pregnancy. Sudden pain felt in abdomen while riding over rough

road, followed by constant abdominal pain and slight vaginal bleeding. Diagnosis of abruptio placentae. Prominent obstetrician performed cervical Cesarean; male child revived with prolonged artificial respiration, but lived only 4 hours. Patient made good recovery.

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THE MECHANISM OF THE D'ESPINE SIGN: ITS SIGNIFICANCE IN TRACHEOBRONCHIAL GLAND TUBERCULOSIS

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The D'Espine sign as originally interpreted by its discoverer[1] is a quality (Timbre) added to the voice which may cause whispering (chuchotement) in the first stage and bronchophony in a more advanced stage. E. A. Gray[2] refers to the sign as the "whisper concomitant" of the spoken voice while Morse[3] considers it as the "whispering sound following the spoken voice." D'Espine laid a great emphasis on the diagnostic value of the sign. He states that "the first signs of bronchial adenopathy are furnished exclusively by the auscultation of the voice, and are found almost always in the immediate neighborhood of the vertebral column between the 7th cervical and the first dorsal, sometimes in the fossa "susepineuse," sometimes in the interscapular space.

Our interest in the sign was aroused by a constant finding during the auscultatory examination of chests. We noticed that with the head bent forward so that it almost touched the chest and the shoulders bent forward so that they were on a line with the knees the voice and whisper sounds could be heard at a lower level than with the head and shoulders in the erect position. This observation aroused our doubts as to the value of the D'Espine sign, for diagnostic purposes. A careful study of the sign was therefore made in a series of thirty patients. From the anatomic standpoint W. S. Miller[4] noted that the bifurcation of the trachea seldom goes below the fifth dorsal vertebra and never as high as the 7th cervical even during fetal life. Such being the case one would not expect to find any tracheobronchial glands below the level of the fifth dorsal. Sieniewicz[5] studied 395 children. His findings are also similar to those of Miller. He found the bifurcation of the trachea in the infant at the level of the 7th cervical vertebra. By the 10th year it reaches down to the 3rd dorsal. When adult age is reached the bifurcation is as low as the 4th or 5th dorsal vertebra. When we auscult the chest, however, we notice that the sounds referred to as the "sign" may at times be heard down to the tenth dorsal vertebra. With the forward stooping position we have been able to elicit the sounds down to the sacrum.

On the basis of these findings we assumed that the whisper concomitant of the spoken voice when heard over the spinal column is not due to enlarged tracheobronchial glands. Our assumption is further re-enforced by the findings of the Committee on Medical Research of the National Tuberculosis Association. In a study of twenty-six children they found x-ray evidence of adenopathy in three children that did not present the D'Espine Sign. On the other hand, in twenty-three children there was a positive D'Espine without any corroborative evidence on x-ray examination.

What then is the significance of the sign? Does it denote anything pathological or is it a blending of normal sounds? An analysis of the mechanism of these sounds may be of value. The whisper concomitant, like all other sound waves, depends upon, first, the force producing the sound; second, the tissues and objects that conduct the sound or interfere with the transmission of the waves and thus act as loads or absorbers; third, the receptive mechanism of the examiner. Thus, a whisper or voice sound may vary from time to time depending upon variations of any one or all three factors. In other words a child having a whisper concomitant on one day down to the second dorsal vertebra may show it at the 3rd or 4th dorsal during the following examination. Assuming that the examiner has the least variation in the perception of sounds, we must see what else may cause changes in the sound waves.

Voice sounds in man are produced by the contraction of laryngeal muscles and the compression of air from the lungs towards the outside. The variation in the shape of the mouth and the laryngeal muscles and also the degree of contraction of the laryngeal muscles will cause changes in the intensity, duration, timbre, and

pitch of the sounds. Bone is the best conductor of sound in the body, next, come all consolidated tissues, and, third, any hollow cavity containing air. Given a sound box such as the chest with the vertebral column to carry sound vibrations, and the hollow cavity between the teeth and the tracheal bifurcation, we are bound to have a very good transmission of voice sounds. The hollow buccal and tracheal cavity in which the voice sounds originate would naturally produce a whispering sound at the end of the voice sound. Such a sound may also be heard when one listens over the treachea anteriorly. With the trachea in fairly close apposition to the vertebrae we would expect to have a better sound transmission posteriorly. With the forward stooping position the bodies of the vertebrae most likely come in closer apposition to each other. Moreover the chest which acts as a resonator is placed in such a position that vibrations from the chest would strike the spine with the greatest intensity. The greater the chest resonance, the greater the intensity of voice sounds over the spine. Thus a patient with a diffuse fibrosis of his lungs would produce voice sounds of greater intensity. Under such conditions we noticed that the whisper concomitant of the spoken voice would reach the tip of the sacrum.

D'Espine claimed that this sign is one of the earliest signs appearing with the enlargement of tracheobronchial glands. During the early stages of glandular enlargement one would expect very little if any fibrosis or calcification. Therefore it would be natural to expect these glands to act as loads and absorbers rather than as conductors. One then should expect the absence of the sign during the acute pathology in the bronchial glands.

A careful study of thirty consecutive children convinced us that the "sign" is of no clinical significance when present. The sign could be elicited at various levels of the spine and in the forward stooping position the sign could be elicited at a much lower level. That the standard of perception is variable in different persons and also at different occasions in the same examiner has been emphasized in our minds during this study. More than once there was a difference of opinion as to the quality, level and intensity of the sounds in a given patient.

CONCLUSION

We may be reasonably sure from our study of the sign, that the sounds referred to as the D'Espine sign are a normal blending of voice and whisper sounds that follow the natural path of transmission of sound waves. The presence of the D'Espine does not seem to indicate tracheobronchial gland pathology. With the forward stooping position the sound waves in the chest become intensified.

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A NEW URETHRAL DILATOR

LUCIUS H. ZEUCH, M. D.

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To obviate trauma to small meatuses incident to passing large sounds for stricture of the urethra, a device, illustrated in the subjoined plates, is offered. This may be passed through a stricture as easily as a metal catheter and there enlarged to the diameter of a number 30

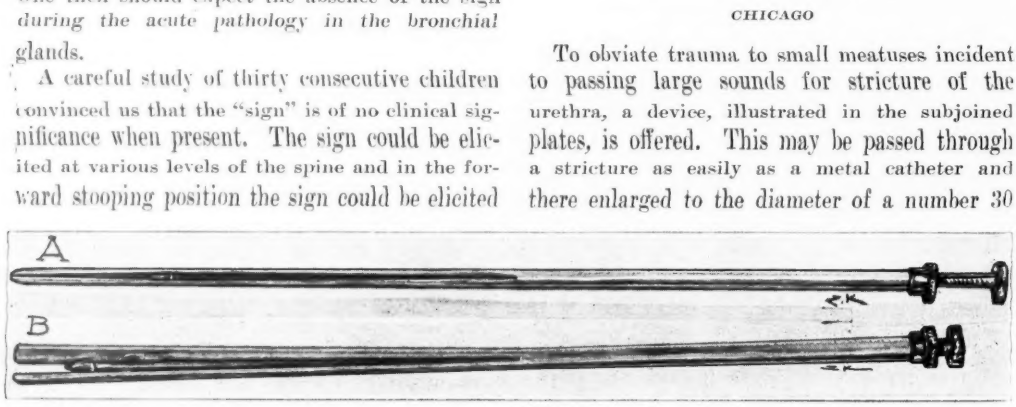

Fig. 1. A—Closed to allow insertion into contracted Meatus. B—Open to dilate strictures.

French bulb sound by means of a screw head at its proximal end. It then may be rotated in situ and withdrawn a few inches toward the meatus, then closed by reversing the rotation of the screw head, thereby restoring the original calibre, and taken out without damage to the meatus or its mucosa.

I am indebted to V. Mueller & Company for perfecting the mechanics of the instrument.

3014 Fullerton Avenue.

A REPORT OF TWO CASES OF TULAREMIA IN CHICAGO

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and

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Only in recent years has tularemia been recognized as a distinct disease. Instances of this type of infection are being constantly recorded from all parts of the country. In New England, Wisconsin and Washington the disease has not yet been reported. Up to July 31, 1928, according to the U. S. Public Health Service, there have been 28 cases reported in Illinois. The two cases cited in this paper are the sixth and seventh observed in Chicago; an eighth case was seen at the Belmont Hospital. In a recent article Francis[1] refers to a series of 679 case reports, but there are more on record. As time goes on and the disease is more often recognized it will cease to be regarded as an unusual malady, and reports of individual or small groups of cases will not be in order. At present, however, its exact distribution and incidence is not fully appreciated, especially by the general practitioner who sees the majority of these patients. For this reason further recording of cases is of interest and serves to emphasize the increasing necessity of keeping this disease constantly in mind when differentiating types of acute lymphangitis and adenopathy accompanied by constitutional symptoms.

Tularemia is a specific infectious disease caused by B. tularense. It is primarily a disease of wild rodents but has been transferred to man by certain infected blood-sucking insects, or direct contamination by material from infected animals. The specific organism was first observed by McCoy in 1911 in the California ground squirrel (Citellus beecheyi-Richardson) and has been repeatedly found in different species of wild rabbits (Sylvilagus, Lepus, Lepus bairdi). Wild rats and in two instances wild mice have been observed to harbor the disease. According to Francis the blood sucking insects that transmit the disease from one animal to another and from animal to man are the horse fly (Chrysops discalis), and the ticks (Dermacentor andersoni, Stilis, and Dermacentor variabilis). Direct contamination accounts for the majority of the cases in man and hence the explanation for its high incidence in marketers, meat handlers, cooks, etc., whose duties include the preparation of rabbits for cooking. The patient may or may not have been conscious of an open skin lesion or abrasion on the hands or arms when he came in contact with the infected carcasses. Experimentation[2] has shown that the micro-organisms may pass through the intact skin of guinea pigs. There is no instance on record of transmission of the disease from man to man, directly or indirectly.

Four clinical types of tularemia, all with constitutional symptoms, are recognized. First, the ulcero-glandular, in which there is a primary papule, and later ulcer, at the site of inoculation and enlargement of regional lymph nodes which may suppurate. The second type, known as the occulo-glandular, is characterized by a more or less severe conjunctivitis due to primary infection in the conjunctiva and enlargement of regional (cervical) lymph nodes. In the third type, known as the glandular, there is enlargement of regional lymph nodes unaccompanied by a primary lesion. The fourth type, or typhoid form, is the most unusual and presents no primary lesion or adenopathy, but instead marked prostration and fever. The diagnosis is not made until typhoid fever has been ruled out and agglutination tests are made in due course of time; or unless prior to this the patient dies and the characteristic lesions are observed at autopsy.

1. Francis, Edward: Tice's System of Medicine, W. F. Prior & Co., Hagerstown, Md. Vol. 3, 1928, p. 663.

2. Simpson, W. M.: Archives of Pathology, No. 4, Vol. 6, 1928, p. 553.

The pathology of tularemia is distinct but not specific.[2] The primary ulcer, when present at the point of inoculation, shows diffuse necrosis of tissue about which polymorphonuclear leucocytes and lymphocytes aggregate in large numbers. In the regional lymph nodes there is inflammatory hyperplasia and areas of caseation necrosis surrounded by endothelial leucocytes, lymphocytes and fibroblasts (depending on chronicity) with occasional giant cells of the foreign body type. Fatal cases have shown foci of necrosis in the liver and spleen and hyperplasia of the reticulo-endothelial elements in the liver. Small areas of necrosis on the pleural surfaces of the lungs, as well as small patches of broncho-pneumonia, have also been observed.

The laboratory diagnosis in tularemia is extremely satisfactory since it affords specific tests. Material from infected animals, or from incised suppurating lymph nodes in man, may be injected subcutaneously into the groin of guinea pigs or rabbits. These die within a week. Autopsy may show inflammatory hyperplasia of regional lymph nodes, but always the liver and spleen are covered with small whitish spots. On microscopic examination these correspond to areas of focal necrosis surrounded by relatively little infiltration by leucocytes. Recovery of the specific organisms from these animals is possible but requires special methods.[1] Danger of contracting the disease by the laboratory workers is very great.

The serum of tularemia patients contains specific agglutinins. These appear about two weeks after the onset of the disease and increase up to the seventh week when there is a gradual decline in the titre. Specific agglutinins probably never entirely disappear. Cross-agglutination with B. abortus and B. melitensis occurs, but the higher titre for B. tularense usually makes the diagnosis clear.

The ulcero-glandular type is the most common form of the disease. The following two case histories afford good examples:

Case 1. R. M., Japanese restaurant keeper, male, aged 40, single, came to the hospital December 3, 1928, complaining of a cutaneous ulcer medial to base of right thumb nail present since November 24, and of painful swollen right epitrochlear lymph node. On November 22 he and G. O. (see below) skinned and cleaned 44 rabbits. On November 24 hyperemia and pruritis developed on right thumb lateral to the nail. This subsequently became more noticeable and on November 26 general malaise, chills, fever, nausea, headache, weakness and vertigo developed. Swelling and pain in right epitrochlear region also was noted. These symptoms persisted for the next two days and in addition a red streak extending from right thumb to right epitrochlear gland was present. Family and past personal histories were irrelevant. Physical examination revealed an irregular cutaneous ulcer about 4 mm. in diameter lateral to right thumb nail and surrounded by considerable redness and induration. The edges of the ulcer were rolled, its crater moist, roughened and dark red. There was an ovoid swelling about 6 cm. in diameter in the region of the right epitrochlear lymph node. This was firm at the periphery but fluctuant in the center and tender. The skin over it was

Fig. 1. Case 1. R. M. Primary lesion of tularemia at basis of right thumb nail.

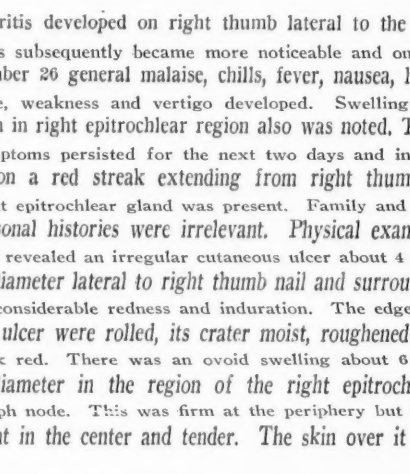

Fig. 2. Case 2. G. O. Primary lesion of tularemia at base of right index finger.

hyperemic. A red streak extended from the base of the thumb up the forearm to this swelling. Axillary lymph nodes slightly enlarged, but not tender. Hg. 85 per cent., W. B. C. 9,200, polys. 83 per cent., lymph. 30 per cent, eosin. 1 per cent, mononuclears. 9 per cent. Urine negative. Temp. 101.4 degrees, pulse 92, Resp. 20. Wassermann 4+, Kahn 4+. Diagnosis: Probably tularemia. On December 6 right epitrochlear swelling was incised with liberation of a few cubic centimeters of thick yellow pus and much necrotic tissue. By December 14 pain developed in right axilla, but no increase in size of lymph nodes was noted. The course of the disease was henceforth uneventful except for development of follicultis on right wrist and forearm which cleared up under usual treatment. Patient was discharged January 11, 1929. The epitrochlear incision was healed, and a small area of hyperemia persisted at the site of the primary ulcer on the thumb.

Case 2. G. O. This patient, a Japanese, male, single, 44 years of age and also a restaurant keeper, was admitted with RM., complaining of a red swollen area on medial aspect of proximal phalanx of right index finger, and of painful and swollen epitrochlear and axillary lymph nodes. On November 22 he aided R. M. in dressing 44 rabbits. On November 26 he dressed an additional 15 rabbits alone. About 1 o'clock the next morning he was awakened by pain in the right axilla and experienced a chill which lasted two hours. The next morning he noted swollen right axillary and epitrochlear lymph nodes and a painless, raised, firm, red area about 4mm. in diameter on the lateral portion of the proximal phalanx of right index finger. In the center of this was a small white spot which the patient pricked with a pin, extracting a small "globule" of "fatty" material but no pus. For two days the patient was very weak, nauseated, and dizzy. By November 29 the right axillary and epitrochlear lymph nodes were much more tender than previously. On admission physical examination revealed: 1. pupils that reacted sluggishly to light, 2. heart slightly enlarged transversely with systolic murmur over precardium and soft diastolic murmur in left 3rd and 4th interspaces, 3. enlarged painful right axillary and epitrochlear lymph nodes, 4. firm, red, raised spot 4 mm. in diameter on medial aspect of first phalanx of right index finger, in the center of which is an oval excavation with deep red granular base. Temp. 101, pulse 102, resp. 22, W. B. C. 13,300, polys. 63%, lymphs. 30%, eosin. 1%, mononuclears. 6%. Urine negative. Wassermann 4+, Kahn 4+. Diagnosis: probably tularemia. By December 8 right epitrochlear gland had become fluctuant and was incised and drained with liberation of a few cubic centimeters of thick yellow pus and much necrotic lymphoid tissue. On December 15 the axillary lymph nodes were very tender and fluctuant, and were also incised and drained. One of the superficial deltoid lymph nodes was also enlarged and painful but not fluctuant. On the fourth day after admission temperature was normal and remained so until patient was discharged on January 13, 1929, with lesion on right index finger consisting only of a red spot, epitrochlear incision healed and axillary incision nearly healed.

The necrotic material and pus obtained at operation in the above cases was injected subcutaneously into the groin of four rabbits. Two died three days and two five days after inoculation. Only in one instance were the regional lymph nodes enlarged. The surfaces of the liver and spleen in each case were dotted with pin head sized whitish spots. Microscopic examination of sections from these livers showed small scattered foci of necrosis about which there was little leucocytic infiltration. Material curetted out of necrotic lymph nodes after each operation was also fixed in acetic-acid-Zenker's solution, embedded in paraffin, sectioned and stained by hematoxylin and eosin. Microscopic examination revealed lymphoid tissue in which there was marked inflammatory hyperplasia with extensive invasion of polymorphonuclear leucocytes. Areas of caseation necrosis were present, but due to the fact that the material was obtained by curettage the normal relationship of these areas to surrounding living tissue was destroyed, and hence it was not possible to observe a zone of endothelial leucocytes surrounding them, as described by others[2].

The serum obtained two weeks after the onset of the disease was negative for agglutinations against B. tularense (test performed by Dr. J. J. Moore). Serum obtained about four weeks later and sent to the Hygienic Laboratory of the U. S. Public Health Service, Washington, D. C., was positive for agglutination against B. tularense in dilution of 1:640 in each instance, thus confirming the diagnosis of tularemia.

No specific treatment exists for tularemia. In the above cases hot, moist dressings were applied as indicated by the lymphangitis and adenitis. Incision, and drainage was performed when fluctuation developed in the affected lymph nodes. The patients were kept in bed until just before being discharged. Although, as said above, infection has not been transferred from man to man, the patients were isolated according to the technique of medical asepsis in infectious disease.

In Francis' 679 cases there were 24 deaths. Fatal cases are usually rapid and fulminant in course.

Both of the above patients admitted exposure to venereal disease. A history of chancre or secondary symptoms was not obtained in either case. The positive Kahn and Wassermann reactions were considered indicative of luetic infection, especially in G. O., the x-ray of whose chest showed an enlarged aortic arch (luetic aortitis?). Anti-luetic treatment was advised.

The authors wish to thank Dr. Lester R. Dragstedt for permission to report these cases.

SYPHILIS OF THE PROSTATE

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Syphilis of the prostate gland is still considered a rare entity in medicine and urology and as a consequence the diagnosis is rarely made. Very few cases have been reported in the literature. Both old and recent text-books only touch upon the subject and dismiss it in a few words. The best discussion which may be found in a text-book is in Hazen's[1] "Syphilis," 1919, in which he discusses briefly the etiology, pathology, diagnosis and treatment.

Young's[2] "Practice of Urology," 1926, devotes one-half page to the subject, comments that the diagnosis is made on presumptive evidence as the lesions disappear rapidly on antiluetic treatment

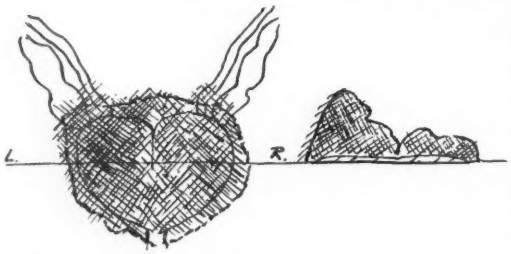

Fig. 1. Extensive involvement of lateral lobes, particularly the left, with enlargement, asymmetry, irregularity and induration.

and suggests keeping in mind commoner lesions such as prostatitis, adenoma, carcinoma and tuberculosis.

Chetwood's[3] "Urology," 1927, devotes one paragraph to the subject stating, "very little is known on the subject and is certainly rare." However, suggests antiluetic treatment and a Wassermann in cases of a hard nodular prostate in which the etiology is obscure.

Stokes'[4] "Modern Clinical Syphilology," 1926, devotes four lines to the subject, stating the disease to be very rare and there were "no distinctive symptoms other than a chronic prostatitis." The therapeutic test and other collateral evidence form a basis for a clinical diagnosis.

Thompson[5] in 1920 reviewed the literature on this subject, adding one case of his own. He found twenty-four possible cases of syphilis of the prostate in the literature dating back to 1851 in which Ricord[6] reported a case in a young man who came to necropsy and was found to have had ulcerations of the prostate and bladder. The lesions were of a phagadenic nature following a suspicious ulcer on the frenum. This is probably the first case of this nature which went to necropsy.

In 1918, Whartin[7] reported a case which was posted and gives an accurate microscopic description of a gummatous prostate. His case died as the result of an injury and had a history of a luetic infection two years previously. He describes the pathology as a plasma-cell infiltration primarily affecting the blood vessels and the stroma of the prostate, rather that periglandular and subepithelial as in a case of prostatitis. In fact the gland spaces appear to be decreased. The larger areas of round cell infiltration contain numerous giant cells with no evidence of necrosis resembling gummata. Spirochetae were demonstrated in these sections.

McDonagh[8] reported a case of syphilitic prostatitis in 1922 occurring in course of florid secondary lenticular syphilide which improved on four injections of salvarsan. Another case was added to the literature in 1924 by Starry[9] in a man of 73 who had prostatic enlargement. A two-stage prostatectomy was performed with an uneventful recovery. Spirochetae and syphilitic changes in the prostate were found.

Salleras[10] in 1925 reviews the literature and reported twenty-eight possible cases of syphilitic prostatitis adding a case of his own in a man, age 55, who had severe prostatic symptoms which were relieved by antiluetic management. His case was diagnosed originally as carcinoma.

Report of Author's case:

Admitted Cook County Hospital, June 2, 1927 on urological service.

A. S. Male—aged 47 years.

Complaint: Nocturia 2 to 4 times a night. Frequency every hour during the day. Difficulty in starting stream, duration 1 month. Inability to urinate, duration 4 days.

Patient stated he had no previous urinary disturbances except occasional nocturia for years.

Past history:

Gonorrhea—20 years ago, chancre denied.

Family History—Negative.

General Physical Examination; well nourished male patient not acutely ill. T. 99; P. 80; R. 20. B. P. 120/80. Blood count normal. Bladder distention 4 fingers above symphysis pubis, atrophy of left testicle, small swelling on globus major of left epididymis.

Rectal Examination; enlarged, irregular, nodular prostate, with infiltration extending well up between the seminal vesicles.

Laboratory Findings; urine, acid, sp. gr. 1028, albumin 1x pus cells 3x. P. S. P. 40% in 2 hours; blood chemistry: urea N. 20,00, creatinine 1.70.

Diagnosis; carcinoma of prostate.

Treatment, put on T. i. D. catheterization.

Cystoscopy 6/6/27 revealed vesical neck deformity of lateral lobe prostatism with edema of vesical neck and trigone. Rectal examination with instrument in place showed the median groove to be free. The lateral lobes, especially the left, felt hard and indurated. Cystoscopic impression was a small fibro-adenoma with acute infection.

Wassermann 6/7/27 4xxxx.

On 6/7/27 patient was put on antiluetic treatment and on 6/18/27 his residual urine dropped to 1½ ounces and was voiding spontaneously.

Rectal examination at this time revealed softening of previous infiltrations with rapid disappearance of the irregularity.

Recystoscoped 6/20/27. Residual urine 1 ounce. The bladder picture had markedly improved. The infectious changes and edema had disappeared.

6/23/27, no urinary complaints except nocturia 1x.

6/25/27, patient discharged; residual urine ½ ounce, prostate symmetrical and almost regular in outline.

Follow-up Examination.

2/23/28, Residual urine ½ oz., prostate was normal size but slightly infiltrated. Repeat Wassermann refused.

The signs and symptoms of syphilis of prostate are not characteristic. The age incidence is usually from 40 to 60 years of age. Urinary disturbance simulating a chronic prostatitis are usually found, with or without a urethral discharge. Discomfort in perineum and rectum, vesical neck irritability with frequency, burning, nocturia and difficulty may be present. Occasionally hematuria is found in cases in which there is an acute posterior urethritis. Varying amounts of residual urine are always present. Complete retention occurs occasionally. The pain may be referred to the back, penis, perineum or down the legs.

Rectal examination usually reveals a prostatic enlargement, irregularity asymmetry, and prostatic or periprostatic infiltration which may extend up between the seminal vesicles and along the posterior wall of the bladder. Most cases reported showed marked enlargement of the right lobe. In the author's case the left lobe was more involved than the right.

The diagnosis is usually not made and carcinoma is frequently suspected. A diagnosis should be thought of in cases which are of the carcinomatous age, give a history of a specific infection or present other findings of syphilis. Other points valuable for diagnosis are: 1, marked irregularity and enlargement of the prostate out of proportion to the signs and symptoms of a prostatitis; 2, its chronic course; 3, concomitant usual good health. The Wassermann is usually positive.

The prognosis is good on antiluetic treatment.

CONCLUSIONS

1. Only about 29 cases are reported in the literature as possible syphilis of the prostate.
2. The prostate is probably more frequently involved inasmuch as syphilis attacks all tissues of the body.
3. The diagnosis must be thought of when other clinical pictures are indefinite, particularly when other signs of syphilis are present.
4. Routine Wassermann examination should be made on all cases of middle aged prostatitis.
5. The therapeutic test usually reveals marked clinical improvement.

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ARTIFICIAL FEVER PRODUCED BY HIGH FREQUENCY CURRENTS

Preliminary Report

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The work of Binger and Christie has shown that a temperature rise in the living tissue of animals can be produced by means of high frequency currents. They have also indicated that a slight rise in the general body temperature of animals has accompanied such experiments. It

was our problem to determine whether a rise of 5-7 degrees F. could be produced in animals and man without injury to the subject. The end idea being to apply such artificial fever production to the treatment of general paresis and other infectious and chronic diseases.

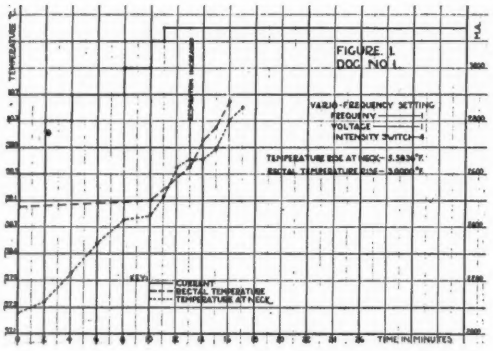

Fig. 1. Dog No. 1. Abrupt rise in temperature both in neck tissues and rectum to 40.6° C. Death through tissue coagulation four days later.

The work of the above quoted authors concerned itself more with the general physiological viewpoint, while we were entirely concerned with raising body temperature to a desired level without tissue destruction. Binger and Christie have shown also that high frequency currents penetrate living tissues.

Our experiments were performed on dogs and men using a well known high frequency generator for the production of diathermy. Currents varying from 1000 to 4000 milliamperes were used.

Fourteen animals were used in our early experiments. Of these the first four died during the experiments or within the two following days. Postmortem examination showed coagulation of the tissue extending to a greater or less depth in the direct path of the current. Since the electrodes were uniformly applied to opposite sides of the abdomen and thorax this cooking of the tissue embraced the deep muscles of the back, the muscles of the abdomen and in some cases also caused a hemorrhagic exudate into the abdominal cavity. The internal temperature of some of the animals posted at death was so high that the operator could not bear to place the gloved finger under the loops of the intestines.

The department of pathology of Northwestern University Medical school will shortly publish a report on the macro and microscopic findings of the brain and spinal cords of these animals.

After these preliminary failures we slowly learned our mistakes. Too much current had been applied too rapidly. The next dog lived but showed extensive skin burns. We then began to enlarge our electrodes, using metal mesh instead of metal foil. Our animals lived longer, nevertheless there were two fatalities due to skin burns and coagulation. We were still in too great a hurry and pushed the current too much.

Next we changed our electrode to spongiopilene and stopped shaving the dogs. Since then all our dogs have lived with the exception of one ether death. In dogs a peculiar body condition exists which does not appertain to man. Dogs do not perspire. The electrode must therefore be kept wet in order to make a good conductor, otherwise burns result. Mesh electrodes and minute skin abrasions produce burns due to sparking and the lessened resistance of the area.

The size of the electrode must be equal and the distance between the electrodes as uniform as the contour of the subject permits. A large electrode on one side, a small one on the opposite side will probably produce burns under the smaller electrode. This is due to the greater density of current. About 100 square inches of

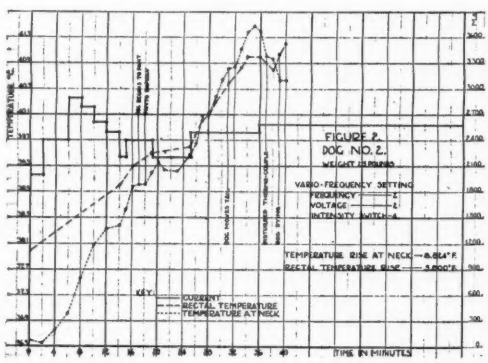

Fig. 2. Dog No. 2. Abrupt rise in temperature to 41.5° C. Rectal and tissue temperatures are finally equalized. Animal died.

spongiopilene for each electrode is sufficient for a forty pound animal.

With this we were able to apply 2500 milliamperes without injury. This approximates 25 to 30 milliamperes per square inch of electrode surface. The fatter and rounder the dog is the

more current can be applied per square inch without injury. The dogs averaged 6 inches in thickness. In man averaging double this in thickness more amperage can be applied per square inch. This is also due to better contact because of the perspiration response of the skin. We intend to give more accurate details in a future paper.

Procedure: The dogs were anesthetized, a thermocouple introduced into the deep muscles of the back and at right angles to the current or else into the deep muscles of the neck. In some experiments two thermocouples were used, one in each location. This procedure makes it possible to avoil the danger of coagulating the tissues beneath the electrodes. The galvanometer deflection method was used in recording the temperatures.

Rectal temperature was taken with the usual clinical thermometer. Respiratory rate was taken in a few experiments. In the majority of the experiments readings were taken every two minutes.

The dogs were shaved until we found this to be an error owing to the impossibility of shaving the animal without some skin abrasions.

Electrodes used were first metal foil, then metal mesh, and later spongiopilene. There is still much room for improvement in electrode application in animal experimentation. Electrodes must be kept saturated with sodium chloride solution approximately of 2 per cent. concentration.

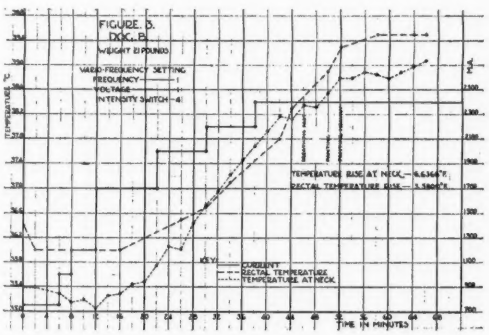

Fig. 3. Dog B. Gradual rise to 39.5° C. both in neck tissue and rectum. Animal lived.

The current was raised gradually to a maximum to produce the desired temperature rise. By the use of a calibration chart the actual temperature in the region of the thermacouples could be readily secured.

The first curve, Fig. 1 (Dog 1) shows the result of too intense application of the current. The rise in temperature is very abrupt and proceeds to the coagulation point of the tissue. The time for a rise of 5.5 degrees F. was only 17 minutes. The dog died four days later. Thirty-one hundred and fifty milliamperes were used on a surface of fifty-five inches or fifty-seven milliamperes per square inch of dog weighing 14 lbs.

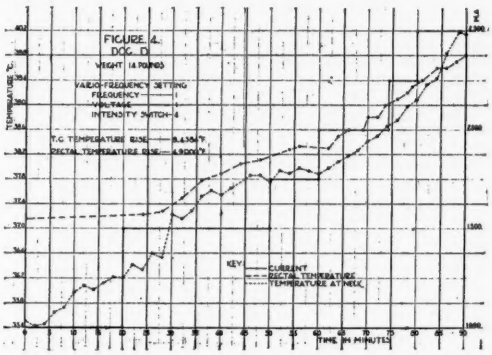

Fig. 4. Dog D. Gradual rise to 40.2° C. Animal lived.

The second curve, Fig. 2 (Dog 2) shows a similar state of affairs. A rise of 9 degrees F. was reached in 40 minutes. In both curves a difference in the rectal and muscle temperature is noted at the start. These temperatures tend to approach each other as the rise occurs until the muscle temperature approximates that of the rectum. This dog died during the experiment and at this moment an abrupt rise of the rectal temperature is seen. The weight of this dog was 25 lbs.

The graph of the first dog which lived is shown in Fig. 3 (Dog B). The time consumed was now 66 minutes the maximum current was 2400 milliamperes and the current per square inch was 43 milliamperes. Extensive skin burns resulted because of the direct arcing through the interspaces of the mesh electrode.

The next graph, Fig. 4 (Dog 4), a light dog, weight 14 lbs. shows a gradual rise in temperature over a period of 90 minutes with a gradual increase in current from 1000 to 2500 milliamperes. A maximum of 45 milliamperes per square inch was used. This was the first animal

on which spongiopilene was used. This was kept fairly wet. At the date of this report the dog is still alive and has recovered from a slight skin burn in fold between the right knees and abdomen.

Figs. 5 and 6 show the graphs of our two

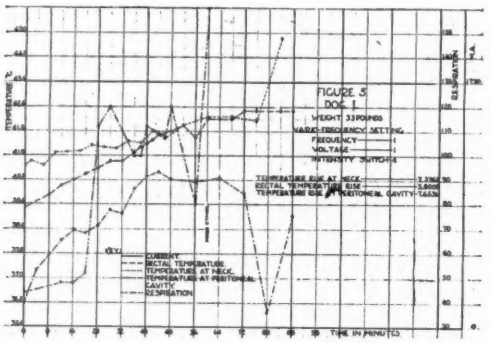

Fig. 5. Dog I. Temperature rise to 44.4° C. in neck tissues, corresponding to sudden drop in temperature of peritoneal cavity. Animal lived.

final experimental animals. Dog I shows an interesting and unexpected result. One thermocouple was placed in the peritoneal cavity while the other was inserted in the deep muscles of the neck. A sudden drop in peritoneal temperature occurred at the seventy-second minute corresponding to an equally abrupt rise of the neck temperature. This would seem to indicate a readjustment of the circulatory temperature load. Fig. 6 shows a typical rise in temperature in a large dog, weight 37 lbs. Here the electrodes

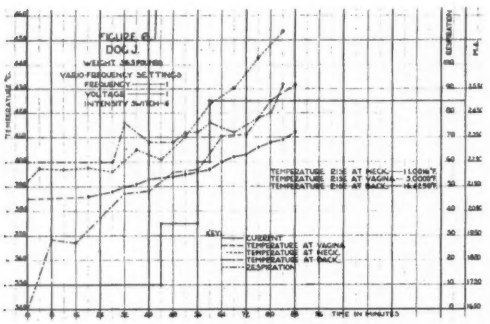

Fig. 6. Dog J. Gradual rise in temperature to 45.4° C. in neck tissues. Corresponding rise in muscles of the back and in the vagina. Animal lived.

had been enlarged to cover practically the entire body of the dog with the exception of the extremities, neck and head and a strip about 4 inches wide separating the two electrodes. Both these animals are alive and the last one shows no effects of the treatment whatsoever. In this animal 35 milliamperes per square inch of electrode were applied.

In Figs. 7 and 8 we submit our final graphs.

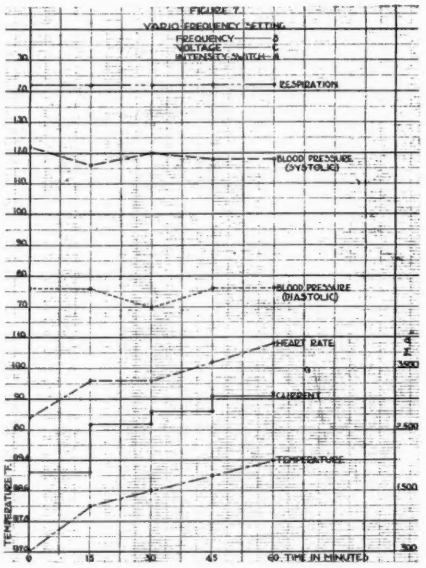

Fig. 7. Normal individual given up to 3000 miliamperes through chest and back, without insulation, for one hour. Temperature rise of 2.4° F.

Fig. 7 is of a normal individual who was treated without heat insulation through the ordinary metal electrodes. A rise of 2.4 degrees is re-

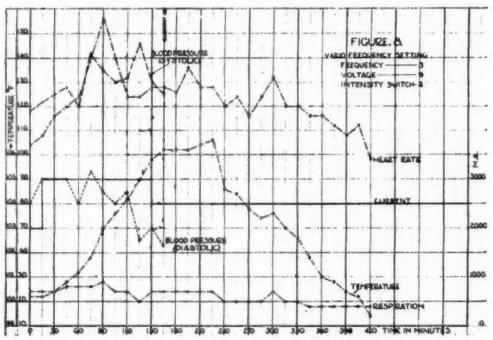

Fig. 8. Case of General Paresis. Given up to 3000 miliamperes through chest and back. Patient insulated with blankets. Rectal temperature rose to 106.1° F. in 2 hours and 45 minutes. After current was cut off a further rise to 106.6° F. was noted. Systolic blood pressure rose, diastolic fell. Temperature normal 4 hours and 15 minutes after treatment had ceased.

corded. The electrodes are now in the process of improvement and with them any temperature desirable can be obtained. Fig. 8, shows the temperature rise of 6° F. secured in a case of general paresis, the patient being still under treatment. We are not yet in a position to report on the clinical results of treatment. We have treated several patients with general paresis and intend to apply this method to the treatment of primary syphilis and various acute and chronic infectious diseases.

CONCLUSIONS

1. Fever can be produced by high frequency currents.

2. Dangers from this form of treatment are encountered by too great and too sudden a density of current and improper contact between the body and the electrodes. These dangers can be largely overcome by perfected technique.

3. However, there may be another danger which cannot be obviated. The anatomical structure between the electrodes may be such that high densities of current are obtained causing probable high local rises in temperature. Whether these rises are above physiologic limits further experiment must determine.

We wish to extend our thanks to Mr. H. J. Holmquist, B. S. (M. E.) Secretary of the Council of Physical Therapy for his assistance in some of the physical problems.

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THE CAUSE OF URINARY RETENTION WITHOUT PROSTATIC HYPERTROPHY*

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A man may have all the cardinal urinary symptoms of prostatic hypertrophy and yet have a normal sized prostate gland. This condition has been termed by French writers as *prostatism sans prostate*, which means that the entity prostatism may exist without a demonstrable prostatic enlargement. This seeming anachronism was first discovered by surgeons, who having diagnosed prostatic hypertrophy on the basis of urinary retention, were dismayed, on opening the bladder, to find no evidence of prostatic tumor. In fact, very often, the prostate was smaller than normal.

This finding of a small atrophic gland gave rise to the view that atrophy of the prostate was a pathological condition, just the opposite of hypertrophy. Such small hard prostates were supposed to be the cause of many troublesome urinary symptoms and were more difficult to remove than enlargements. The first case of this type was reported in 1830 by Guthrie, an English surgeon, who performed an autopsy on a patient who died from urinary retention due supposedly to prostatic hypertrophy. Examination of the bladder revealed an elevation of the tissue at the bladder outlet, which he termed "a bar at the neck of the bladder."

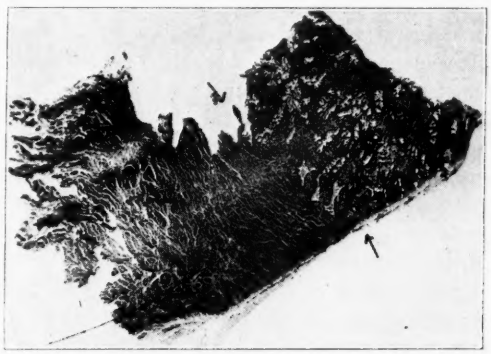

Fig. 1. Photomicrograph showing apex of prostate and bladder wall. Arrows indicate boundary of prostate. Note absence of capsule; also, sharp division between prostate and bladder musculature.

Between the years 1835-1840 three pioneer French urologists, Etiolle, Mercier and Civiale, wrote on the method of diagnosing and treating obstructions at the bladder neck. Mercier claimed the cause of obstruction was a "valvule," while Civiale applied the term "barrier." The German school wrote on atrophy of the prostate. Ciechanowski (1890) championed the view that primary atony of the bladder muscle, caused the urinary retention. Guyon (1889) termed the cases which fell into this category as prostatisme vesical. American urologists saw the necessity

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for adopting a clinical term which would serve to properly classify this group of cases and Chetwood (1901) introduced the title "Contracture of the Bladder Neck." Some years later, Young (1909) described a similar condition and called it "median bar."

In reviewing the various clinical descriptions, Randall came to the conclusion that all were writing about the same condition, differing only as to the causative factor. Why should nine different observers find as many pathological states to explain urinary retention. The answer is that each writer believed that any condition which could bring about a retention of urine must of necessity be a mechanical obstruction and each investigator searched until he could find some plausible explanation. The many illustrations which supposedly depict this condition are drawings, in which the artist has of necessity, incorporated the author's conception of a bar. Photographic evidence of pathological material to prove the commonly reported elevation at the bladder neck termed "bar," is lacking. In 1857, Sir Henry Thompson was somewhat dubious concerning the validity of the numerous reports of "bar formation" and searched the museum of the College of Surgeons to find illustrative material, but located only a single specimen. He states, "Nevertheless, although I have occasionally seen an example of the kind here described, it has been so infrequently, that I could not do otherwise than regard it as extremely exceptional, notwithstanding that Mr. Guthrie has expressed himself to the contrary."

What then is the cause of urinary retention when no prostatic tumor exists? To answer this question, it was first necessary to determine the relation of the prostate to the bladder sphincter and the emptying mechanism of the bladder. Here, I believe, lies the solution of this apparent enigma. Inflammation of the prostate may extend into the bladder muscle and so infiltrate it, that the sphincter is not able to normally open and close. A long existing prostatic infection may produce a sclerosis of the bladder neck. This is possible because the capsule of the prostate is incomplete and does not entirely surround it, as claimed by urologists, but is missing over the apex and base of the gland. Poirier, Charpy and Piersol call attention to this fact. To definitely prove this important point, I have sectioned that part of the bladder wall adjacent to the prostate. Examining the microphotographs of this area, one can see the sharp termination of the prostatic gland cells and the adjacent bladder wall, without any intervening capsule. Infection of the prostate can extend directly into the bladder muscle. Seminal vesicle infections may affect the same result, by first involving the prostate. This infiltration of the bladder muscle, overlying the prostate, includes the internal sphincter, part of the trigone and adjacent muscle tissue. Urine in the bas fond region is the most difficult part of the bladder content to evacuate; it being necessary to force it out by contraction of the muscle beneath the trigone, assisted by the perineal muscles. If this portion of the bladder is unable to contract, urine will collect here, after micturition, and this constitutes the residual urine. Hence, we may have urinary retention without a mechanical obstruction.

The most important practical phase of this problem is the attempted removal by prostatectomy of the so-called urinary obstruction. Almost every surgeon has had the experience of trying to remove a prostate which was so adherent that it was impossible to establish a line of cleavage. After struggling for a considerable period, to remove the gland in its entirety, he finally removed as much as possible, piecemeal. Whenever such a condition was encountered, the surgeon often claimed that the adherence of the gland was due to carcinomatous process. He reasoned thus, because having made a diagnosis of prostatic hypertrophy before opening the bladder, any difficulty experienced in his ennucleation could be due to only one thing—a malignant process, which causes the gland to adhere firmly to the capsule. Here again the error was made in trying to live up to a diagnosis. If surgeons would recognize the relationship of the gland to the sphincter and realize that a chronic prostatitis may effect such changes within the sphincter as to prevent the bladder from emptying itself, they would not erroneously operate on such cases as prostatic tumor.

RESUME

1. Urinary retention is often due to fibrosis of the muscles forming the bladder neck. This is caused by an extension of a persistent prostatic infection.

2. It is unsurgical to attempt to remove such prostates.

3. The capsule of the prostate does not entirely surround the gland, but is absent at the apex and the base.

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TRAUMATIC RUPTURE OF THE NORMAL SPLEEN*

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Rupture of the spleen, spontaneous or traumatic, is imperfectly understood and though many hundreds of cases have been reported in the literature, the subject demands much additional study. Spontaneous rupture of the spleen has occurred in typhoid fever, in amyloid degeneration, in malaria and in many other pathologic conditions associated with splenomegaly. The pathological spleen, owing to its enlarged volume, increased friability and lessened mobility consequent to the presence of perisplenic adhesions, is predisposed to traumatic rupture. Traumatic rupture of the pathologically enlarged spleen may follow a slight accident as in the case reported by Dorolle[1] in which a soldier with an enlarged malarial spleen died a few minutes after having been struck a light blow on the side. At autopsy, the spleen presented two tears, one, on its external, the other, on its internal surface. It weighed 995 grammes; the abdominal cavity contained over 3 litres of blood.

Usually, rupture of the normal spleen results from a severe abdominal contusion or crushing injury. The vast development of automobile traffic on our streets has increased the frequency of this lesion. Therefore, a paper on the subject is not untimely and may serve to emphasize the importance of splenic rupture and the possibility of its being overlooked in patients, victims of automobile accidents. This paper deals only with traumatic subcutaneous rupture of the normal spleen. Such a rupture is usually due to a direct crushing injury on the left hypochondrium or over the left thorax as one may sustain in a fall from a bed, tree, etc., from a blow, a kick (man[11], or horse[17]), or from the impact of a hard body, a fractured rib, etc. Rupture, due to penetrating wounds from without, we will not consider at this time. The small volume, mobility and location of the normal spleen all protect it to a certain extent from injury.

Berger,[2] in 1907, collected from the literature 467 cases of splenic traumatism, 306 of which were subcutaneous injuries. Two years later, Borgsitter[3] increased the number to 203 surgically treated cases. Barnes, in 1914, reported 31 further cases of rupture of the normal spleen and Willis,[5] in 1919, found 53 more cases reported.

Etiology.—This injury occurs in both sexes; in children[10] and in adults. Age or sex, of course, have no significance in traumatic cases. The automobile has many advantages and has become almost a necessity to a large section of the population, but it is also a powerful agent of injury and death. Many cases of traumatic rupture of the normal spleen reported in the medical literature of recent years have been the result of automobile accidents. Alamartine,[6] Koltes,[7] Willis[5] 2 cases, Garlock,[9] Frank[10] and Chalier[12] have reported cases of the kind. In McCracken's[13] 20 cases, one-third were due to train or motor-car accidents. To produce a splenic rupture, it is not necessary that the car should pass over the victim; in a collision, such

*Report of three cases with a cursory review of the literature.

an injury may also result to an occupant of the car. In Kolte's case, the patient had been thrown out of the car and was operated on for a splenic subcapsular hemorrhage, 4 days later. In 2 of the 5 cases reported by Butler and Carlson,[8] the patients had been struck by an automobile; in the other three cases, the wheels passed over them. In most of the reported cases, the patient has been struck by a machine. A fall on the left lower ribs on a sharp surface is liable to cause a splenic rupture.

Splenic rupture may result from an abdominal traumatism elsewhere than in the splenic region. Latouche's[14] patient was a child 10 years of age who, following a fall on the right side, presented a splenic rupture. Forced extension and exaggerated flexion of the body have caused splenic rupture; at times, the fragment of a broken rib is the causative agent.

In automobile accidents, usually, the rupture is produced by a direct blow on the flank over the spleen or else by the spleen being compressed between two hard opposing surfaces either directly or through the medium of the ribs.

Within the past year I have removed two ruptured spleens. In reporting them, I wish to report also a case in which ten years ago I removed a ruptured spleen. All these patients were victims of automobile accidents. Short histories of these cases follow:

CASE HISTORIES

Case 1. R. R., male; 8 years old, referred by Dr. L. Roth. History: The boy having been struck by an automobile was conveyed immediately to his home and there seen successively by several physicians who failed to make a definite diagnosis. Dr. Roth was consulted 48 hours after the accident. The child then complained of severe abdominal pain and tenderness, both especially marked in the left hypochondriac region; he was pale, nauseated and apparently suffering from deep traumatic shock. Over the left hypochondriac region, the abdomen was tense, contracted and rigid. Temp. 99, extremities cold and clammy, pulse 100 and weak. A blood examination showed: R. B. C. 2,950,000; W. B. C. 14,350, hemoglobin 45 per cent. The symptoms suggested an internal hemorrhage and an immediate laparotomy was decided upon. Operation: Ether anesthesia. Rupture of the spleen being suspected, a long, left transverse, subcostal incision was made. On opening the peritoneum, a large quantity of fluid and clotted blood escaped; it was found to proceed from the lower pole of the ruptured spleen on the convex surface of which could be seen a large stellate fissure partly filled with large clots. After walling off the intestines the spleen was exteriorized, its pedicle was clamped and ligated serially with double ligatures of chromic gut and the organ removed. Peritoneal toilet and closure of the abdomen; no drainage. An infusion of 500 c. c. of saline solution was given. The boy made an uneventful recovery.

Case 2. Miss J. H., aged 20 years, was knocked down by an automobile. While still unconscious, she was taken to the St. Paul Hospital, Chicago, where for about 48 hours she remained in a condition of intense traumatic shock; she had a very rapid and weak pulse, a facies of cadaveric pallor and marked dynopea. T. 95; p. 105; Resp. 24. Under continuous application of the usual restorative measures, the patient began to improve.

Examination: The patient's body showed several contused areas. The expectorate was slightly blood-tinged. Tenderness and muscular contracture, fairly marked over the whole abdomen, were particularly noticeable in the upper left hypochondium; there was a moderate degree of tympanites. The left hypochondrium was dull on percussion. Fracture of the left tenth and eleventh ribs could be demonstrated. The patient complained of pain in the left shoulder. Blood examination showed R. B. C. 3,050,000; W. B. C. 12,700. Fifty-eight hours after the accident, owing to the continued presence of all the sgns and symptoms of an acute anemia indicative of an internal hemorrhage, it was determined to explore the abdominal cavity.

Operation: A splenic rupture being suspected, the abdomen was opened by a left subcostal incision. The peritoneal cavity contained a large amount of free and clotted blood which was quickly removed. Exploration traced the hemorrhage to the spleen which was found ruptured in the superior pole. After ligature of the pedicle with chromic gut, the organ was removed; two gutta-percha drains extending to the former splenic bed were inserted. They were removed two days later. Abdominal closure. The left side of the chest was immobilized by overlapping strips of adhesive plaster extending over the left half of the thorax from the anterior median line of the body to the posterior median line. Following the operation, a subcutaneous infusion of 700 c. c. of saline solution was given. It was repeated daily for three successive days. The patient made a smooth recovery. One month after the accident, the only symptom present was some pain over the left chest on coughing, sneezing or yawning.

Case 3. Referred by Dr. Ross, H. A., 18 years old. sustained abdominal injuries in an automobile collision. He was immediately conveyed to the Iroquois Hospital, Watseka, Illinois. When seen two days after the accident, he was suffering from intense abdominal pain and presented a board-like rigidity of the abdominal wall and other signs of abdominal injuries. Pain on pressure was especially marked in the left hypochondriac region; patient was very pale, pulse and respirations were accelerated; patient had vomited. Splenectomy, recovery. Ten years later, he is

in excellent health and is able to work the same as his comrades.

Symptoms of Splenic Rupture. The most important immediate symptoms of splenic rupture are, as may be expected, those that arise from severe abdominal visceral injuries, viz., traumatic shock, hemorrhage and abdominal phenomena. Vomiting is not a constant symptom. These immediate symptoms do not as a rule enable us to differentiate a splenic rupture from that of any other abdominal viscus. Generally, it is only after a delay of several hours, or even days in some cases, that the intensification of existing symptoms or the appearance of new ones focuses attention on the spleen.

In every case of abdominal contusion, splenic rupture is a possibility. Therefore, in examining patients with traumatic abdominal injuries, the possible clinical symptoms associated with splenic rupture should always be kept in mind. This is very important in automobile accidents, as in these victims the contusions and injuries are often general and are not necessarily confined to the hypochondriac region. It is well to remember that such injuries may happen within a car as well as to those injured by a car striking or passing over them; severe blows on the flanks or a costal injury in the neilghborhood of the spleen are very likely factors in the production of a splenic rupture.

Let us consider the most salient symptoms caused by splenic rupture. Shock is usually, but not invariably, present. It is manifested by its usual signs and symptoms: pallor, cold sweat, drawn facies, rapid respiration, small and rapid pulse, etc. Patients may get up and walk for some time after the accident, but syncope appearing some hours or some days after an abdominal injury, associated with a small rapid pulse is suggestive of a delayed hemorrhage, and when supported by other corroboratory symptoms, is almost pathognomonic of splenic rupture. This delayed or recurring syncope is indicative of recurring hemorrhage and calls for immediate operative relief. Persistent pain and tenderness especially when stronger later than at the time of the accident are also symptoms of great value. The pain in the case of a splenic rupture may not be strictly localized. It is always most marked in the superior abdominal quadrant, it may be iliac, inguinal or irradiate to the lumbar region. In character, the pain is acute, often stabbing, and is more intense on pressure and in the dorsal decubitus.

Pain in the left shoulder[5] when present is a very important though not an absolute symptom of splenic rupture. It has been reported in about 10 per cent. of the cases, although it is probable that it was present in many others but not looked for. This sign has been observed in spontaneous as well as in traumatic rupture of the spleen. It was present in one of my cases. It may be a late sign as in Havlicek's case[15] of hip dislocation and associated splenic and pancreatic rupture in which it was only observed on the fifteenth day after the accident, at a time when there were no abdominal symptoms. The corresponding upper limb is also usually cold. Quenu[16] attributes this scapulo-humeral pain to possible irritation of the inferior surface of the diaphragm by blood clots and also to irritation of the centripetal fibers of the splenic nerve, the medullary centers of which are adjacent to those of the sensory nerves of the shoulder. On the other hand, Havlicek thinks the pain is referable to the splanchnics rather than to the phrenic nerve. Muscular contraction or rigidity of the abdominal wall is usually a very early and progressive symptom; at first, it is localized; later, it becomes generalized (board-like abdomen). It may be delayed, Hubbard[17] and Latouche[14] or absent even in complete rupture. It was observed in about half of the reported cases and it is more likely to be found on the left than the right side. It was present in all my cases.

Tumefaction over the region of the spleen, either stationary or progressive in character, has been reported in a few cases and is indicative of a strictly localized effusion of blood or hematoma. The pulse may not be accelerated. There have been cases in which patients with an abdomen full of blood have shown an approximately normal pulse; nevertheless a very rapid thready pulse, when present with other signs, is highly suggestive of internal hemorrhage. Temperature usually falls immediately after the accident but may return to normal or higher within a few hours.

Dullness is usual over the lower abdomen. The most important sign connected with dullness is that known as Pitts and Ballance's sign, first

described by them in 1896. It apparently has received but little attention as it is recorded as having been sought only in a very few of the reported cases. Pitts and Ballance[18] found that if there be present an effusion of blood in the abdomen from a ruptured spleen, when the patient was turned on the right side the flank remained dull owing to the presence of fixed clotted blood, but on turning the patient on the left side the right flank becomes sonorous. This sign, right-flank sonority and persistent left-sided dullness on change of position is strongly presumptive, in fact, is practically pathognomonic of splenic rupture. Its absence, however does not negative the presence of splenic rupture.

Hemorrhage: In injuries and ruptures of the abdominal viscera, symptoms of internal hemorrhage furnish an almost imperative indication for immediate operation. In the cases collected by Berger[2], hemorrhage was the immediate cause of death within the first hour in 52 per cent. of the cases of splenic rupture; in 14 per cent. between 1 and 16 hours, and between 1 and 24 hours in 34 per cent.

In immediately fatal hemorrhage, Quenu[13] states that the patient presents great pallor, cold extremities and cold and clammy skin. The patient complains of vertigo, tinnitus aurium. The pulse is small and rapid, the temperature low and the respirations superficial. The abdomen is painful and on palpation presents areas of dullness.

The common type of hemorrhage following splenic rupture is, however, not so striking. The extent and nature of the rupture determines the amount of hemorrhage. The extravasated blood may become partly encysted or slowly escapes into the peritoneal cavity owing to clotting at the vascular orifice, vasoconstriction, muscle contraction, etc. The hemorrhage may become arrested by clotting as the blood pressure drops, to recur again as the patient's condition improves. The hemorrhage may be interstitial forming simple ecchymoses or small subcapsular or intra-splenic hematomas. When the capsula itself is rupture, the blood may either be encysted through the formation of peri-splenic adhesions or in the absence of adhesions, effuse freely into the peritoneum.

Finally, there may be what is called delayed or secondary hemorrhage. In such cases, the patient makes a rapid apparent recovery and there are no immediate symptoms of internal hemorrhage. However, after a period varying from hours to days, the patient, especially after some exertion, some increase of intra-abdominal pressure, such as attends coughing, defecation, suddenly collapses with all the symptoms of intense internal hemorrhage. Rupture into the peritoneal cavity of a subcapsular hematoma[20] or the giving way of protecting perisplenic clots or adhesions may determine all the symptoms of acute anemia.

Pitts and Ballance[18] in 1896 reported 17 cases of delayed hemorrhage after splenic ruptures. In the more recent literature, Schlegel[19] reports a case of splenic rupture in which 12 days intervened between the accident and the time of operation. In Cisler's[20] case, the interval was the same and the patient had left the hospital and had resumed his occupation. There were 1½ litres of blood in the abdomen following rupture into the peritoneal cavity of a splenic subcapsular hematoma. In Patel and Vergnory's[21] case, the free interval was 13 days and in Eisenklam's[22] case due to a fall out of bed the interval was 19 days, which is the longest I find recorded. In Eisenklam' case, the spleen presented a nine-centimeter gaping tear in its parenchma. In this case, 19 days after the traumatism, the stretched splenic capsule burst and there resulted pain and shock, an outfloow of blood into the peritoneal cavity. Previous to the involvement of the peritoneum, the patient had experienced little or no discomfort.

Blood: In a few cases, diagnosis was based on the blood examination revealing a large fall in red blood corpuscles. Butler and Carlson[8] in 1926 reported nine cases; in all the patients, except one, the leucocyte count was about 16,000. In the case reported by Koster[23] in which the patient was struck by an automobile the blood count showed R. B. C. 2,500,000, W. B. C. 12,200 and hemoglobin 35 percent.; and in all my cases the red blood count was low.

Thoracic Injury: Chalier[12] in a recent article has drawn attention to the costal injuries so frequently associated with spleen rupture. When the injury is of a crushing injury, some of the ribs are likely to be fractured. The spleen is deeply imbedded under the diaphragmatic cupola and is protected by the inferior border of the

thoracic cage. In order that a rupture be produced, Chalier thinks it is necessary that there be a concomitant lesion of the thorax which may amount to a fracture of the ribs and in the case reported by him (which also was an automobile wreck case) and in some reported by other clinicians there was such an injury. Three of the nine cases reported by Butler and Carlson showed such an injury; there was a rib fracture in one of my cases. In general, the literature shows that the possibility of such an associated injury has been frequently overlooked; it probably was present but not noticed in many of the recorded cases. It is stated to have been observed in from 10 to 15 per cent. of the published cases.

Diagnosis: From the foregoing it can be easily inferred that an exact preoperative diagnosis of splenic rupture is not always easy, is not always possible even though signs and symptoms may be very suggestive, very presumptive. Diagnosis ought to be based on the patient's previous state of health, the circumstances attending the injury and particularly on the mode and time of appearance, grouping and evolution of the symptoms. Although splenic rupture may follow any abdominal traumatism, it is more likely to occur if violence be applied either laterally on the external face of the base of the thorax or from the front backward on the anterior abdominal wall in the left superior quadrant.

Failure or delay in diagnosis aggravates the prognosis. In Berger's collection of cases, a preoperative diagnosis was made in only 15 per cent. In 19 previously unpublished cases, observed either by Quenu and his colleagues, a clear diagnosis was made in eight and a probable diagnosis in three. In the 151 operated cases of traumatic splenic rupture which Quenu collected from the literature, an exact preoperative diagnosis was made in 43, and in 15 others a diagnosis of internal hemorrhage was made without precise location of the injured viscus. As a general rule, the exact diagnosis followed an exploratory laparotomy indicated by the smptoms of acute abdominal hemorrhage. In my own cases, the operative indication was internal abdominal hemorrhage, injury of the spleen being strongly suspected.

Quenu thinks that a diagnosis of traumatic splenic rupture can be made in the latent period, when a patient who has recently received an injury involving the left hypochondrium, shows a certain sensitiveness in this region as well as a certain degree of persisting abdominal wall contraction, especially if the temperature keeps about 38:C.

Differential Diagnosis: Rupture of the liver may simulate splenic rupture especially in a child having a well-developed left lobe of the liver. Splenic rupture may simulate rupture of the left kidney, but the latter condition is associated with hematuria. Ruptured gastric ulcer is accompanied by more intense peritonitic phenomena and by frequent hematemesis. In a case reported by Wallace,[24] the diagnosis was cholecystitis but in this case the splenic rupture had occurred two years before, following a blow from a car and the ribs had been fractured but the patient had recovered spontaneously. Moreover, the case was complicated as being one of transposition of viscera. In women of the childbearing age, a ruptured ectopic fetal sac would have to be excluded.

Evolution: When the rupture is not very extensive and only a small hematoma intra-splenic or peri-splenic results, the effused blood may in time become absorbed or encysted; it may initiate a fibrous tumor by organization of the clot; or it may undergo purulent transformation. In Wallace's case above referred to, the ruptured spleen was found in a mass of adhesions; it was fibrous and atrophied.

When not very extensive, a rupture may heel spontaneously. Descout.[25] Hueggler[26] at the autopsy of a patient who had died from a hepatic neoplasm 15 days after a splenic rupture, found the splenic tear closed by a resistant thrombus.

If a splenic rupture be left to its own evolution, the mortality varies from 38 to 90 per cent. according to different statistics. Of 168 cases collected by Berger in 1907, 145 died the first day, the fatal result being due to hemorrhage in 90 percent. The prognosis is much better in children; Fevrier[27] reported 15 cases occurring in patients under 20 years of age; 12 of these recovered. Quenu found that the mortality of splenic rupture treated by splenectomy in patients under 20 years old was only 14 per cent. as compared with 32 per cent. in patients above that age. Schlegel found that 15 cases of splenic rupture treated by splenectomy within 1½ to 12 days after the oc-

currence of the accident gave 12 recoveries.[19] The condition of delayed hemorrhage has already been alluded to.

Complications: Traumatic rupture of the spleen may be the only lesion present; it may be one of two or more near or distal associated lesions. Contusions, lacerations and ruptures of the left kidney, pancreas and liver are the most frequent complicated lesions. Chavannex and Guyot state that rupture of the left kidney has been found in 25 per cent. of the reported cases of splenic rupture. Havlicek[15] and Zeano[29] each report a case of simultaneously ruptured spleen and pancreas. In these two patients, removal of the spleen was followed by recovery. Coexisting gastric, diaphragmatic or other injuries may aggravate the patient's condition.

Pathology: In traumatic splenic rupture, the lesion may vary from a simple contusion characterized by sub-capsular ecchymoses and integrity of the capsule to multiple tears, T, Y-shaped or stellate fragmentation or even complete avulsion of the viscus from its vascular pedicle. There may be a crushing or a bursting of the organ. Pohl[30] in 1910 reported a case successfully operated on in which a child 3½ years old was crushed beneath the wheels of a carriage; the splenic vein alone was torn, the artery being uninjured.

In some cases, there is only an intrasplenic effusion of blood or a hematoma of greater or lesser volume which, as already stated, may form the starting point of a serious or fatal secondary hemorrhage. In splenic rupture proper, the capsule is usually torn and there may be detachment of a portion of the substance of the spleen into the abdominal cavity.

Opinions vary as to whether the internal or external face of the spleen is most usually injured; the lower part of the spleen being least protected is more frequently the site of injury.

Treatment: From the high mortality which attends the expectant treatment of splenic rupture, it is evident that the only effective treatment is operative. When a fairly probable diagnosis has been established delay is dangerous. A properly performed needless laparotomy is practically without dangers; a non-operatively treated splenic rupture is almost invariably fatal. Delay only serves to diminish chances which operative aid may have to offer. The surgical measures may be divided into conservative and radical procedures. The exposure of the spleen may be done under either paravertebral or general anesthesia.

The conservative measures applicable are cauterization, ligature of the splenic pedicle, tamponade and splenorraphy. Ligature of the vascular pedicle en masse, is liable to cause necrosis of the organ. It is to be rejected. If the splenic artery alone is ligated, atrophy of the parenchyma results. It may perhaps be employed when there are extensive vascular adhesions. Conditions very rarely warrant its performance.

Tamponade, though it may be quite effective in arresting hemorrhage, has two important drawbacks. At best, it is a very uncertain measure and it eventually leaves a weak spot in the abdominal wall. Tamponade either alone or combined with simple suturing, may be resorted to in cases of limited rupture or when the condition of the patient does not warrant a long operation. Berger's statistics include 10 cases of splenic rupture treated by tamponing with one death, and Quenu gives 15 cases with two deaths.

Splenorraphy was first done by Lamarkia in 1896 and has been employed by many surgeons since then. Owing to the inaccessibility and friability of the spleen, it is generally a difficult operation; its general mortality has been reported as 50 percent., but Willits, in 1919, found it to be 25 per cent. If splenorraphy is done, the suture line should be covered with omentum as Gourrin[31] suggests, both for hemostasis and peritonization. It is only rarely practicable.

In general, splenectomy is the operation of choice in any important splenic rupture, particularly a transversal rupture or in extensive lacerations. It insures complete and permanent hemostasis. In the absence of perisplenicadhesions, it is of easy and rapid execution. Partial splenectomy is indicated when the lower pole of the spleen is completely detached and the remaining part integral.

A median incision may be employed for an exploratory laparotomy but the splenectomy (subcostal) incision should be used when a fairly precise diagnosis is made. It must be said, however, that the diagnosis is usually a probable diagnosis. To the median incision may be added

a transverse incision extending towards the loin.[3] An adequate incision is most serviceable in cases of associated visceral lesions. One must be careful not to injure the tail of the pancreas.

Splenectomy appears to have been first done by Roddick, in 1885, who removed the organ through a small opening in the lumbar region. In Berger's statistics, 135 splenectomies gave a mortality of 38.7 per cent. Borgsitter in 1909, who collected 203 cases of splenectomy (not all traumatic cases), found the operative mortality of splenectomy to be 35.3 per cent. Willis in 1919 found that the mortality of splenectomy for traumatic rupture cases was 28.8 per cent. Schlegel states that in fifteen cases in which an interval varying from 1½ to 12 days elapsed between the occurrence of the injury and the operative relief, splenectomy gave 12 recoveries.

In the Mayo clinic[32] the mortality in 417 cases of splenectomy for all conditions, done from 1904 to 1926, is stated to have been 10.3 per cent. Only 10 of these were traumatic cases. According to Quenu, the general mortality of splenectomy for adults above 20 years old is 32 per cent. and for individuals under 20 years 14 per cent. The operation can be successfully combined with nephrectomy as in Hersey's[33] case.

Is splenectomy, in the human subject, attended with lasting undesirable after-effects? This can be more intelligently answered after a brief enumeration of the functions[33] of this organ. Removal of the organ means a temporary, a partial or complete abolition[35] of those functions partly or wholly dependent on the spleen. What are these functions?

(a) During prenatal life, the spleen participates in the formation of leucocytes and of red blood-cells. After birth, it takes part in the destruction of deteriorated or disintegrated red blood-cells. It has been called the "graveyard" of the red blood corpuscles. The liberated hemoglobin of the destroyed blood corpuscles is conveyed by the splenic vein to the liver and there transformed into bilirubin. According to some investigators, the liberated hemoglobin may be manufactured into bilirubin in the spleen itself.

(b) It forms white blood corpuscles, particularly lymphocytes. A large number of lymphocytes are produced by the Malpighian bodies. "All the white blood-cells have defensive functions, especially the large mononuclear endothelial leucocytes." Mayo.

(c) It assimilates iron and is a storehouse for it, especially the iron liberated from the decomposition of red blood-cells. The liver, on the contrary, is the storehouse of the iron ingested; it may partake of the spleen function. The spleen is regarded by some as the principal organ of the reticulo-endothelial system, playing a dominant role in iron metabolism.

(d) It acts as a scavenger, as a filter, separating worn-out cells, infectious and toxic agents from the blood stream. These under normal conditions, are either destroyed by the phagocytic activities of the spleen or conveyed into the liver for destruction or detoxication. As the lymphatic glands act upon the lymphatic stream, so the spleen acts upon the blood brought to it.

(e) It has some share in nitrogenous metabolism and it plays an important part in the digestion, consumption and utilization of food (Richet). During digestion, the spleen expands and contracts synchronously with the digestive periods. "That the spleen must be of some significance in digestion has been prompted by the gland's intimate anatomic connections with the portal system; its blood supply from the celiac axis, its proportionately excessive atrophy during starvation and inanition, and by references by many experimental investigators, as well as by many clinicians, to a state of hunger and voracious appetite after splenectomy." (Kahn.)[38]

(f) It acts as a kind of vascular reservoir to the portal system and to the vessels of the stomach.

(g) Under normal conditions it produces blood platelets.

(h) It elaborates ferments, and also a hormone which has a stimulating action on bone-marrow. By its pump-cells, it influences blood pigments and metabolism. The bone-marrow is called the "cradle" of the red-blood corpuscles.

(i) It is considered by some investigators as a member of the sympathetic endocrine system. It has no external secretion and it has not been demonstrated that it has an internal secretion.

Following the removal of the normal spleen as in traumatic rupture, in splenic neoplasms, etc., certain changes usually occur. In cases in which these changes fail to develop, the exist-

ence of one or more accessory spleens may be suspected. After splenectomy, there is noted:

(a) A secondary anemia due in part to the operative hemorrhage incident to splenectomy, and in part to the loss of the spleen.

(b) An increased resistance of the red blood-cells to various hemolytic agents (hypotonic salt solution, hemolytic serum, etc.).

(c) A lessened tendency to hemoglobinuria, to jaundice and sometimes even an absence of jaundice after the exhibition of hemolytic agents.

(d) An increase in the total fat and cholesterin content of the blood which gradually decreases and returns to normal (Eppinger). This has been observed both in splenectomized dogs and in the human.

(e) A transient decrease in the antiseptic and bactericidal properties of the blood serum which rapidly returns to the normal. The agglutinins and opsonions remain unaltered (Bucalossi). The bodily vigor and resistance are decreased.

(f) Changes in the blood-picture which usually persist for several months[35], [38]. The blood-picture usually returns gradually to normal. In some cases, the postoperative anemia is permanent.[35]

1. Appearance of polycythemia, 5,500,000-7,000,000 per cu.m.
2. Numerical increase in lymphocytes and in eosinophiles.
3. Presence of nucleated red blood-cells.
4. Morphological changes in the red blood-cells.

(g) A disturbance in the iron metabolism.[36] An increased output of iron in the feces which lasts for from four to six weeks.

(h) An hypertrophy of remaining splenic fragments, of accessory spleen or spleens, even to the size of the normal spleen, a hyperplasia of the lymphatic glands of the greater curvature of the stomach and of the omentum, a hyperplasia of lymphoid tissue throughout the body, and an increase in the size of the liver. This hypertrophy compensates in time for the loss of the spleen.

(i) A weakening of the digestive power for a period of several months. There is a temporary diminution in gastric secretion.

(j) Owing to the release of the controlling influence of the splenic hormone, the bone-marrow functions to excess. It also changes from its normal yellow fatty character to a red cellular hyperplastic type.

(k) A decrease of fat in the feces.

The spleen is an important organ. Nevertheless, animal experiment and clinical observation amply show that splenectomy does not noticeably impair growth, reproductive power, general health, nor apparently shorten life expectancy. That this ductless gland, the largest in the body, is not as essential an organ as the liver, the thyroid gland, the pancreas or the adrenals, is evidenced by its rare absence at birth and by the survival of patients after its removal. After splenectomy, the functions of the organ are vicariously assumed by other elements of the reticulo-endothelial system. These elements are found in the sinuses of the lymph glands, in the capillaries of the liver lobules (stellate-cells of Kupffer) and of the bone-marrow, in the connective tissue (wandering cells), in the adrenal cortex, in the hypophysis, etc. The cells of the reticuloendothelial system devour deteriorated blood-platelets, effete red and white blood corpuscles and metabolize all of these.

Accessory spleens occur; they vary in size, location and number (from one to twenty). In a patient operated[34] on for strangulated intestine, fifteen years after a previous splenectomy for splenic rupture, the following findings were noted: "The whole of the peritoneum covering the small intestine and mesentery was covered with small tumors, varying in size from that of a pin's head to about one inch by half an inch. These tumors were either sessile or pedunculated, and appeared to have involved only the peritoneal covering of the gut. There were perhaps 200 to 300 tumors. The general appearance suggested splenic tissue; they appeared to be quite innocent in character. The microscopical examination by the Pathology Department, University of Sheffield, of one specimen removed for examination, showed that it was a small mass of splenic tissue, containing pulp with sinuses and Malpighian bodies. The whole structure presented a dense fibrous tissue capsule, and an increased amount of fibrous tissue in the trabeculae. In this case, evidently, at the time of splenic rupture living splenic cells were set free and implanted in the peritoneal cavity. The

amount of splenic tissue so formed appeared to be quite equal to that in a normal spleen."

According to Koster, there appears to be some general compensatory lymph gland enlargement following splenectomy; Jolly and Lieure[39] have reported that in animals there is a possibility of a real regeneration of the spleen; and O'Connor[40] mentions the possibility of accessory spleens functioning after splenectomy.

CONCLUSIONS

1. Traumatic rupture of the normal spleen is becoming more common with the increase of automobile accidents. Three personal cases of this kind are reported.

2. The symptoms of splenic rupture are in general not pathognomonic except perhaps Pitts and Ballance's sign of left-sided dullness and right-sided sonority on percussion.

3. The patient's safety lies in early and precise diagnosis, followed by immediate laparotomy and appropriate operative relief.

4. The prognosis in cases of splenic rupture left to their own evolution is extremely bad. In the presence of splenic injury and severe internal hemorrhage, immediate or delayed, the most conservative form of treatment is early splenectomy. It secures complete and permanent hemostasis. It is a life-saving operation.

5. Removal of the ruptured normal spleen is usually an operation easy and rapid of execution. The removal of the pathological spleen embedded in or bound down by dense perisplenic adhesions may present great though not insuperable difficulties. Drainage is rarely indicated.

6. The operation of choice for important splenic rupture is splenectomy, performed under paravertebral or general anesthesia. It is the present belief that splenectomy does not materially shorten the life of the individual. Earlier operation, improved technique and judicious postoperative treatment have lowered and improved the results of splenectomy.

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PRESENT TREATMENT OF ERB-DUCHENNE BRACHIAL BIRTH PALSY*

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An obstetrician first described the brachial birth paralysis. Much has been added since to the knowledge of the condition, particularly regarding the cause and etiology in the field of obstetrics. To the neurologists we owe a great deal for their contributions about the symptoms. An explanation of the findings on the basis of

the pathological lesion has been their chief concern. The problem of treatment has in the main fallen to the lot of the orthopedists. Many therapeutic measures have been advanced. It is the first concern of this paper to show those methods which have proven the most satisfactory. The conclusions are based on a study of thirty carefully chosen cases observed at the Mayo Clinic and the Caroline Institute.

The literature on the subject though profuse contains a confusion of terms. Erb,[1] in his original article describes it as a paralysis of that part of the brachial plexus which contracts upon superficial stimulation at Erb's point. Erb's point lies two centimeters above the clavicle and lateral to the posterior border of the sternocleido mastoid muscle at the level of the transverse process of the sixth cervical vertebra. Electrical stimulation at Erb's point produces contraction of the deltoid, the supra- and infra-spinatus, the biceps, the brachialis anticus, brachioradialis, and supinator longus and brevis muscles. These muscles correspond to the ones paralyzed in the case described by Duchenne.[2]

Frequently the extensor carpi and the extensor digitorum communis are included. On the other hand the infra- and supra-spinatus as well as the supinators may occasionally remain uninvolved.

A flaccid paralysis of the muscles named above results in a very characteristic deformity of the upper extremity. The arm hangs at the side and is adducted and rotated inwardly at the shoulder. The forearm is pronated and slightly flexed at the elbow. With the palm drawn up this produces the so-called policeman's or porter's tip position. In addition to the diagnostic position there is atrophy of the musculature without sensory disturbance. The affected limb is smaller than its mate. When such a condition occurs at birth it can be defined as an Erb-Duchenne brachial birth palsy.

History: Brachial birth palsies undoubtedly were observed long before the first recorded description by Smallie[3] in 1768, in which case both arms were involved. Then for nearly a century the subject was neglected. Not until 1851 did Danyan[4] report a case of upper paralysis where a post-mortem examination performed eight days after birth revealed bruising and hemorrhage around the brachial plexus. Soon after Gueniot[5] reported a similar case. Duchenne, in 1872, in a study of electrical reactions, recognized the existence of an actual paralysis. Two years later Erb was able to localize the lesion in these cases by electrical stimulation of the plexus at about the junction of the anterior trunks of the fifth and sixth cervical nerves. Seeligmüller,[6] in 1879, expressed the opinion that the lesion was due at times to stretching as well as compression of the nerve. Until 1879 the characteristic position of the arm after a birth injury was considered as proof of a plexus lesion at Erb's point. Küstner[7] at this time advanced the theory that the symptoms described in brachial birth palsy were due to displacement of the upper epiphysis of the humerus.

Kennedy,[8] in 1903, presented the first description of an operation upon a brachial plexus lesion in an infant. Two years later this description was confirmed by the pathological findings as set forth in an excellent article on brachial birth palsies by Clark, Taylor and Prout.[9] Whitman,[10] in the same year, emphasized the importance of the disability due to dislocation of the shoulder in these cases. Fünck,[11] in 1909, declared the typical position of brachial birth palsy due to a luxation, while Turner Thomas,[12] a few years later, stated that the position could be explained by the assumption of a primary injury to the capsule of the shoulder joint. Peltesohn[13] compromised these views, believing that there has been included under the diagnosis of brachial birth palsy distinct varieties of pathological lesions producing the same type of deformity. About this time Taylor[14] emphasized the presence of a nerve lesion and advised early operation on the plexus. Hoffa[15] and Spitze[16] had long since performed osteotomies of the humerus to correct the inward rotation. Fairbanks,[17] in 1913, and later Sever,[18] called attention to the corrective measures against the deformity and brought forth the division of the subscapularis muscle as a successful operative measure. In 1917 Platt[19] discussed the different views regarding the pathogenesis of the condition. Subsequently, Bentzon,[20] whose thesis on obstetrical paralysis of the brachial plexus appeared in 1922, believed the causative factor to be a tearing of the nerves of the brachial plexus. Valentine,[21] who later described an avulsion of the nerve, agreed with this opinion.

Etiology: Two theories of etiology have been

mentioned—injury to the shoulder joint and a lesion of the brachial plexus. Shoulder joint injuries do occur at birth and in the early stages give rise to the same symptoms as a brachial palsy. The course of recovery eventually distinguishes them. They have thus become known as pseudo-birth palsies. Pseudo-birth palsies may be the result of a congenital dislocation of the shoulder, of an epiphyseal separation or an epiphysitis, or of an injury to the joint capsule which causes a contracture. According to the views of Schubert, heredity is an important factor in the occurrence of an Erb's palsy. He stresses the frequent occurrence of other congenital diseases as torticollis, congenital elevation of the shoulder and the absence of pectoral muscles together with Erb's palsy. To find a satisfactory explanation for these lesions as well as the brachial plexus paralysis, he resorts to the hypothesis that they are dysplasias and that the paralysis of the arm is due to a congenital defect of the nervous system. The operative and post-mortem findings prove that an injury does occur in the plexus and gives rise to a true birth palsy. At first it was believed that this injury was caused by pressure over Erb's point when the finger is hooked around the arm pit during delivery. The same sort of injury was supposed to be caused by the blade of the forceps. Bullard[22] objected to this opinion, stating that it was anatomically impossible to produce such a pressure paralysis in a normal baby. It has since been shown that the nerves may be pressed and impinged between the first rib and clavical in such a way as to cause a paralysis. Experiments on animals and cadavers have shown that traction can produce the lesion underlying an Erb's brachial paralysis. The traction can be produced by pulling the arm;[23] by hyperabduction at the shoulders and by forceful elevation of the arm at the shoulder. It has been shown further that the paralysis may be caused by over-extension or separation of the child's head from its shoulder. This seems to be the usual method of occurrence. Predisposing factors would therefore include everything that makes for manipulative interference, the application of forceps, or, in short, a difficult labor.

Morbid Anatomy: Experiments on the reaction to the faradic current led Erb to study the brachial palsies and in this way to localize the lesion in the upper part of the plexus at about the juncture of the anterior root of the fifth and sixth cervical nerves to form the upper cord. Before localizing the lesion further let us consider briefly the nerve supply of the paralyzed muscles. The deltoid is supplied by the circumflex nerve which comes from the posterior cord of the fourth and fifth cervical nerves; the supraspinatus and infraspinatus muscles are supplied by the supra-scapular nerve (fourth and fifth cervical); the brachialis anticus has a double nerve supply, musculospiral and musculocutaneous (fifth, sixth and seventh). The chief supply of the paralyzed muscles is therefore from the fifth and sixth cervical nerves. The subscapularis muscle, through the short scapular nerve, and the pectoralis major, through the anterior thoracic, also receive their supply from the fifth and sixth cervicals. Neither of these muscles are paralyzed, however, This means that the lesion must be posterior to the origin of the short scapular and the long thoracic nerves. The sympathetic nerves are occasionally injured in Erb's palsy. This would pre-suppose an injury of the eighth cervical and first thoracic nerves; since neither of these are involved, however, an explanation is sought in the fact that the sympathetic nerve, being more fragile, is injured before the corresponding cervical and thoracic nerves.

It must be remembered that the muscles opposing the paralyzed ones are also involved inasmuch as it is these muscles which give rise to the deformity. The pectoralis major contracts and forms an adduction deformity. The unopposed subscapularis contracts to resist passive external rotation. The extensors and pronators of the forearm, due to insufficient opposing muscles, give rise to further deformity. The limited supination is partly due to the external rotation of the shoulder. The slight flexion at the elbow results from contraction of the anterior surface of the joint capsule. The joint capsule is also responsible for some of the deformities occurring at the shoulder. It may contract and cause further immobility or it may stretch and give rise to a dislocation.

Although, as we have seen above, the primary lesion involves the anterior root of the fifth and sixth cervical nerves, autopsy and operative findings show a great deal of variation in the extent as well as the severity of the pathological in-

volvement that occurs in the brachial plexus. The findings differ with each individual case and with the length of time the condition has existed. The cervical fascia is usually thickened and frequently transformed into a firm scar tissue which imbeds the nerve trunks. Strangulation of nerve fibers occurs as a result of this contracting scar tissue. Buckling of the perineural sheath may cause pressure of the nerve fibers. The nerve roots are actually torn. In a few instances the nerve roots have been found completely severed with frayed ends terminating in scar tissue. Usually there is an incomplete tear of the fibers. In less severe cases the perineural sheath and small vessels to the nerves have been torn and hemorrhage had taken place between the nerve fibers and the perineural covering. Complete avulsion of the nerve roots with changes in the cord have so far been demonstrated only in atypical cases.

Symptoms: Just as the morbid anatomy varies, so too, the symptoms differ. In one case the palsy may be more extensive or more complete than in another. Symptoms also differ according to the length of time the condition has been present. This difference permits a convenient division into three stages—the acute stage, the stage of recovery, and the residual deformity.

Immediately after the birth of the child the arm lies limply at the side. Frequently the supraclavicular area shows discoloration. At times a hematoma can be palpated in this area. The muscles of the shoulder and arm are tender. Passive motion seems to cause pain. Pressure over the brachial plexus will usually cause the child to cry.

The stage of recovery may begin a few days after birth or not until three months have elapsed. To the patient this is the most important period. If the recovery begins at once it usually goes on very rapidly during infancy and is followed by a slight general change covering one to two years. In those cases where the improvement begins later there is a more constant course of recovery with the maximum amount of improvement in the first six months. The power of the muscle returns spontaneously and in some instances goes on to complete recovery. Provided there is no treatment instituted the extremity assumes the typical position. As would be expected from the description of the morbid anatomy the degree of recovery varies. Recoveries will necessarily be less complete when the nerve is torn than when it is merely stretched.

The third stage or residual deformity may occur as early as two years of age, but is usually established at adolescence. In addition to the characteristic attitude the army may now proceed to further complicating deformities. The paralyzed muscles show atrophy which is not as complete as in poliomyelitis. Some fibers are left intact. At times the opposing muscles give rise to contractures to the extent of limiting passive motion. There are no sensory changes. Growth is impaired in the extremity involved, which is smaller than its mate. The paralyzed muscles of the shoulder allow the joint capsule to stretch. Contracture of the unopposed pectoralis major and supracapularis will draw the head forward to cause an anterior dislocation of the shoulder joint. A posterior dislocation can be explained as a result of contracture of the paralyzed muscle and the surrounding tissues of the joint. Limitation of movement may occur at the elbow due to contraction of the joint capsule and surrounding tissues.

X-ray: The roentgenograms at the three different stages show progressive osseous changes. During infancy there is no appreciable abnormality. The stage of recovery brings with it a delayed growth of the epiphysis in a glenoid fossa which is shallower than normal. The scapula is small and the superior angle is prominent. In the final stage the roentgenogram shows a large hooked or, occasionally, a rudimentary acromial process. The humerus shows osteoporosis. The head of the humerus is seen to be flat or oval shaped and, at times, dislocated.

Complications: A dislocated shoulder is but one of several complications. Paralysis of the sympathetic nerves previously mentioned as a rare complication gives rise to Horner's syndrome, that is, a ptosis of the upper eyelid, a dilated pupil, and occasionally endophthalmos plus a vasomotor disturbance of the side of the face and chest. The humerus or the clavicle may be fractured. Other deformities such as malformed bones of the forearm, torticollis, or an absent pectoralis major may co-exist.

Diagnosis: The diagnosis can be established by the history and the characteristic attitude

except for the pseudo-palsies. These are distinguished by the x-ray. A traumatic dislocation, a fracture or an epiphyseal separation, or a luetic epiphysitis cannot escape the roentgenogram. Poliomyelitis and diphtheritic paralysis occasionally require a little study, which a spastic paralysis is more easily differentiated. The history eliminates the traumatic brachial palsies of the adult.

There are two other types of brachial birth palsies, the Klümpke or lower arm type and the Dejerine or full arm type. A review of cases has shown that it is not a hard fast line that distinguishes these types; yet the classification is retained as a clinical convenience. The prognosis and the treatment differ in these forms from that of the Erb-Duchenne.

The Treatment: Prophylaxis is the duty of the obstetrician. Ehrenfest warns against the misuse of the forceps, the digging in of a finger at Erb's point during extraction of the head, and the application of traction on the head in a laterally flexed position. Every unnecessary manipulation should be avoided. Even then the palsy may occur, as illustrated by the fact that the Ex-Kaiser had a birth palsy though Jenner was the obstetrician.

The treatment in the first stages consists of rest. As soon as the condition is recognized the arm should be held in abduction and external rotation. A carefully made plaster-bed is more efficient than fastening the arm to a pillow or to the crib. Local heat to the supra-clavicular area is best applied with moist dressing.

Physiological rest for the paralyzed muscles and protection against contractures are the orthopedists' rules during the stage of recovery. The form-fitting splints of celluloid or, where this is not possible, of plaster of Paris, are superior to the usual aluminum and tin splints. Recently I have used a split cast made of starch bandages which has the advantage of being light, easily applied and form-fitting. The hand is held dorsiflexed, the forearm in supination, the elbow flexed to ninety degrees, while external rotation and abduction are maintained at the shoulder joint. With the disappearance of muscular tenderness massage is started and followed by passive motion. Stimulation with the faradic current has a beneficial effect. Active motion is encouraged early. The child plays with toys that require the use of both hands, as a large ball or an overhead bar. The hand must be trained to attempt the usual functions in the normal way. The splint is worn whenever the hand is not in use. Daily manipulation correct the tendency to deformity. A complete plaster cast gives fixation but can be used only for a relatively short period since it interferes with growth.

To correct the deformity in the third stage manipulation under anesthesia followed by fixation has been tried with indifferent results. The operation that has universally proven most satisfactory is the division of the subscapularis. At times it may also be necessary to do a tenotomy of the pectoralis major. Where the acromion is enlarged it had best be corrected by a wedge osteotomy. The operation is followed by application of a plaster of Paris cast to maintain complete fixation. Prolonged fixation must be avoided. The plan adopted by Bentzon is to remove the upper part of cast from two to three weeks after operation. Then with the arm held in a splint when not in use physio-therapy is carried out for about six weeks to three months. To overcome the pronation of the forearm tenotomy of the pronator teres and converting it into a supinator after the manner of Tubby gives satisfactory results.

Exploration of the plexus, though it still has staunch advocates, is gradually falling into disfavor. An avulsed root cannot be repaired. A certain amount of recovery occurs spontaneously. Though very few deaths have been reported surgery upon infants carries a high mortality. Most surgeons agree that the results do not justify the risk of an exploratory operation.

There is no treatment for a Horner's syndrome. A fracture of the clavicle, I have found, can be held by means of a "T" cross even in infants. A humerus fracture was satisfactorily treated with splinting. In both cases it was deemed best to treat the fracture before starting the treatment for the birth palsy. The secondary dislocation of the shoulder has been combated by reefing of the capsule, by the Claremont operation, and by shortening the tendons of the supra- and infra-spinatus and teresminor. The last operations seems the most logical in view of the morbid anatomy.

Review of Cases: The review of thirty cases emphasizes the prominence of the role played by

trauma as an etiological factor. Fifteen (15) of the cases were delivered by forceps, five (5) were breach deliveries, four (4) were difficult labors. Only two (2) were normal deliveries. Six (6) were omitted since the type of delivery was not satisfactorily determined. Sex played no role since fourteen (14) were females and sixteen (16) males. The right arm was involved (16) times, and the left thirteen (13) times. One case had a bilateral involvemest. Nineteen (19) were typical cases of the Erb-Duchenne type. Six (6) were seen only in the very early stage and the type was not established. Two (2) cases closely simulated the Dejerine type and three (3) the Klümpke type of birth palsy. All were improving or had improved spontaneously. Ten cases were seen before the age of one year had been reached and eight between the age of two and three years. Practically every age from four to twenty-five years was represented with no two cases registering at the same age. The treatment was necessarily so varied that only impressions could be gathered and these have been expressed above. The roentgenogram showed the head of the humerus flattened in two cases and a long coracoid process in two instances. The epiphysis was under-developed in one case and ten cases were reported negative. Of the complications the dislocated shoulder was the most frequent, being present seven times. In two instances it was of a recurring type. A fracture of the humerus occurred twice and in two cases anesthesia was present in the fingers. There was a single instance, each of a fracture of the clavicle, an Horner's syndrome, scoliosis, torticollis, strabismus, congenital anomaly of the hand, and bilateral club feet as a complication.

CONCLUSIONS

1. The clinical classification of Erb-Duchenne, Klumpke and Dejerine types of birth palsies should be retained in spite of the fact that no hard fast line distinguishes them. The treatment for each is different.

2. Primary lesions of the shoulder joint with the same symptoms as the Erb-Duchenne type are a pseudo-birth palsy. The treatment of these is manipulation and early motion.

3. The lesion of an Erb-Duchenne paralysis is in the brachial plexus. The character of the lesion contra-indicates the risk of an exploratory operation of the plexus.

4. In the first stage the use of form-fitting splints is indicated. A split cast of starch bandages has the advantage of being light, economical, and form-fitting, without interfering with growth.

5. In the third stage the Sever-Fairbank type of operation gives good results.

6. The complications should be treated separately. The logical method of treatment for secondary dislocation of the shoulder is by shortening the tendons of the supra- infra spinatus and the teres minor muscles.

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THE ROLE OF FUNGI IN OCCUPATIONAL SKIN DISEASES*

(With Especial Reference to Superficial Fungus Eruptions of the Extremities)

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Introduction

As superficial fungus diseases of the skin are now recognized as being very common, their role in cutaneous eruptions in industrial workers needs appraisal. Pusey[1] states that eczematoid eruptions of the feet and hands due to fungus infections have been seen or recognized with increasing frequency until the disorder has become established as one of the common dermatoses. These superficial mycotic eruptions, commonly called by the profession "ringworm," can at times become economic disasters of the first degree as far as incapacitating is concerned; furthermore, the deep invaders, e.g. blastomycosis, can even imperil life. Such eruptions can occur secondarily to injury or irritation received while working or the victim may have been infected by industrial contacts; they can be intensely aggravated by contact with irritants incident to working surroundings, or they can occur independently of the working conditions. Thus great importance becomes attached to their etiological capacity in order to better attack them from a therapeutic standpoint to decrease loss of valuable time of a skilled employee, thereby causing monetary loss to the employer and naturally to the insurance company.

In the past four years I have had the opportunity to study the clinical manifestations, to make laboratory examinations and to watch the therapy in 912 cases of skin eruptions considered of superficial fungus infection. In 48 of these with findings primarily on the extremities, the occupational factor had to be critically analyzed. These patients were seen in various places; a few while taking special dermatological work with Dr. J. H. Stokes, a large number in association with Dr. E. D. Osborne, others in the practice of Dr. A. W. Stillians and the others by myself in the dermatology clinic of the Northwestern University Medical School and in my own practice. Whenever in doubt as to the cultural findings, Dr. F. D. Weidman, Director of the Laboratory of Dermatological Research of the University of Pennsylvania was kind enough to determine the proper classification.

Literature. In Dr. R. Prosser White's excellent brochure on "Occupational Affections of the Skin[2]," mention is made of industrial workers' infections with the animal ringworms, favus, and such deep fungus invaders as actinomycosis. No specific mention can be found of any etiological importance attributed to the accepted superficial cutaneous invaders of the epidermophyton and certain trichophyton families in skin infections of extremities. Irritating dust containing dry fungi of the mucor family and the spores and mycelium of other moulds as aspergillus and penicillium are cited[3] as causing dermatitis of the uncovered parts of the body. However, in discussing the dematitis on the hands of flax spinners and soakers, an interesting suggestion was made. These workers, when piercing and guiding the thread, constantly expose their hands to solution of chloride of sodium and to the sulphates and other salts of lime, as well as to gumming substances through which the threads pass. Leloir[4] is quoted as stating that lactic and butyric acid are present in this mixture. The hands are continually macerated with these and as suggested by the writer of that monograph, these workers are further subjected to the irritating action of the contained moulds and bacteria.

Lane[5] emphasizes the many angles to be considered in the border line occupational skin disturbances. Blaisdell[6] mentions the difficulty of always making an absolute distinction between the fungus infection being primary or related to the patient's employment.

That fungi which ordinarily attack animals can cause epidemic eruptions of the body which assume great occupational proportions is well illustrated by a recent report of Ravaut, Basch and Rabeau[7]. 194 out of 1,000 women working in government department consulted them from 1923 to 1927 for ringworm of the glabrous skin. The fungus, *Trichophyton niveum radians,* was in all probability introduced there by a cat. The epidemic was promptly stopped by sterilizing ev-

*Clinical, Experimental and Therapeutic Studies in Mycotic Dermatitis, V.

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ery coat and giving each woman an individual clothes hook as the women had been in the habit of throwing their coats in piles on arriving at work.

In a recent paper on the broad general aspects of industrial dermatoses, Foerster[8] discussed several important angles of the fungus factor in occupational eruptions. He enumerated the infections of fungus origin causing primary occupational dermatoses, vip: trichophytosis (tinea corporis) observed in farmers, horse and cattle dealers, and handlers of fresh hides, sporotrichosis as seen in horticulturalists and farmers, blastomycosis and actinomycosis in farmers, mycotic paronychia and dermatitis of fruit canners and many cases of epidermophytosis. He emphasized the importance of the epidermophyton fungus in secondary infections of the occupational dermatitides and believes that such infections are compensable when the occupational disorder was a direct predisposing cause. If such a fungus dermatitis develops, or a latent infection of this type becomes activated, even through excessive perspiration or warmth at work, without an immediately preceding and ex isting occupational injury or inflammation, Foerster considers such a disease non-compensable because it would not have been a direct consequence of occupation. In regard to the legal aspects, the law is interpreted differently in different communities.

Terminology—(Superficial Invading Fungi)

As this study embraces in detail cases of superficial fungus invasion, no attempt will be made to discuss the deep fungi except one brief case report to show their occasional complication following an industrial injury. The terminology and classification of fungi has become very puzzling to the expert mycologist—the tendency now is to simplify the cataloguing so as to make it intelligible to clinicians.

To indicate these infections in a broad way, many terms have been used, the most common one being "ringworm" and "eczematoid ringworm" of the extremities. The usage of the term ringworm was at first limited to the ringed lesions of the body and to fungus diseases of the hair. As these infections of the extremities e. g. like these under discussion and those of close contact or intertriginous surfaces, were found to be of fungus origin, the term has gradually been extended to include all superficial fungus infections of the skin regardless of location or morphology. As these eruptions are confined to the horny layers of the epidermis, the condition has often been called epidermophytosis which further implies it is due to the epidermophyton fungus. It is now known that only occasionally does the epidermophyton actually produce this and that it is due many times to another entirely different species called *Trichophyton interdigitale.* However, these findings are primarily of academic interest. The terms dermatophytosis and epidermomycosis have also been used. Perhaps this commonly used term, "ringworm," meaning such a superficial mycotic dermatitis is as logical as any and then if further investigation is carried out, the causative fungus name or species can be appended. As far as terminology is concerned, the main thing to remember is that these are not the usual ringworm infections of the body and scalp (tinea corporis and tinea capitis), often due to a fungus which infects animal skins; the latter do, at times, assume occupational importance. These fungi under discussion are invaders confined to man which are usually associated with intertriginous foci, e. g. toes, groins, fingers, axillae egc., a definition so aptly stated by Weidman[9] in a recent paper.

Laboratory Studies. The clinical manifestations are often characteristic enough to make a diagnosis; demonstration of the fungus makes the diagnosis absolute. While the causative fungi may be of different species, microscopically they usually appear as refractile threads after digestion with 10% aqueous solution of sodium hydroxide. Occasionally they appear in a "mosaic" form. This term is applied by Weidman[10] to the fungous form where the hyphae or threads follow the intercellular clefts, surrounding the small and large polyhedral spaces, which collectively give the "pavement" effect. While this mosaic arrangement may represent a fungous form in a degenerate state, they are considered pathogenic. In addition to the foregoing, yeast or budding fungi are now believed to be pathogenic[11] for certain people; further study must be made to ascertain their importance in superficial occupational dermatoses. Kingery

and Thienes[12] have found a yeast-like organism to be the causative agent in fruit canner's dermatitis, a disease affecting the fingers and finger nails.

Roofs of deep seated vesicles or overhanging scales of borders of the lesions were clipped and placed in 10% potassium hydroxide. These preparations should be allowed to stand for at least 24 hours in a moist chamber, being examined at intervals for fungi. The quick examination as suggested in many text-books is insufficient; brief heating will often hasten digestion. The low power of the microscope is usually sufficient; the high power should be used to confirm the findings so as not to mistake extraneous objects for fungi. The fungi appear as refractive thread like organisms, sometimes branching and occasionally short, stout, and segmented like bamboo pole; others appear in the mosaic form as described.

Scrapings were routinely planted on Sabouraud's media. Approximately 20 per cent. of the cultures grew, taking about two weeks—these were considered *Trichophyton interdigitale* except one which was *Epidermophyton inguinale.* Many saprophytes grew as well. Most authorities agree that it is practically useless to plant a culture for hyphomycetes where the alkali preparation is negative for hyphae; hence the most important laboratory procedure is the simple well known extemporaneous alkali preparation. No mosaic forms grew in this particular series. In other nonoccupational cases a small number of these mosaic forms have grown in culture as yeasts—the significance of this cannot be stated at this time.

The presence of fungus is usually interpreted as an indication of pathogenicity. In rare instances only have hyphomycetic fungi been found on skin areas considered normal even in intertriginous areas. However, it is difficult to believe that fungi of admitted pathogenic properties do not exist occasionally as saprophytes for in cases of intermittent severity they must lie dormant between attacks.

Classification. (Superficial Invading Fungi). A useful simple classification of the superficial invaders based on major morphological characteristics can be cited. Where the extemporaneous potassium hydroxide preparations show the thread like forms or hyphae (often called mycelia) these fungi can be called hyphomycetes; if round, budding or yeast fungi are found, they can simply be called yeast; if both hyphae and budding forms are present, then it falls into the clinical group of thrush, the causative organisms usually being members of the monilia family. Occasionally some monilia fungi appear as hyphae only.

ILLUSTRATIVE CASE REPORTS

Keeping in mind the pitfalls one may encounter in properly pigeon-holing these often perplexing cases, I have divided them into three groups. Obtaining an accurate history is very necessary; the industrial aspects should be thoroughly elicited. All patients were thoroughly examined physically to detect any contributing constitutional factors.

Group I. Fungus Dermatitis of the Hands Considered Independent of Occupational Factor.

The afflicted person almost always assumes that any and all skin eruptions are due to the work in which he is employed. Naturally a fungus dermatitis can occur in any person, especially in a susceptible skin. It is only human nature to assume that one's occupation might cause a skin eruption but this assumption cannot be accepted on face value for it often means unnecessary transfer to another line of work to which the patient may not be fitted.

Case 1. J. A., a man aged 33 (observed by the courtesy of Dr. Leslie MacNaughton), had an eruption on hands, feet and face and had been unable to work for ten weeks. He was employed in a steel mill and had worked at the same type of labor for many years. No new work had been assigned to him and no external irritant could be detected. General examination was negative. The forehead and sides of neck showed discrete erythematous scaling patches; on sides of the fingers were scaling, crusting areas with deep vesicles interspersed, especially in the margins of the lesions. On the dorsa of both feet, especially the right, there were large erythematous areas reaching from the toes back almost to the ankles. Examination of scaling areas from feet and hand for fungi revealed thread like hyphae. The face manifestations were considered a dermatophytid (a toxic manifestation from the fungous foci of the extremities). With fungicidal therapy (discussed later) the patient was able to go back to work in two weeks' time.

Twelve cases were placed in this group.

Group 2. The Occupational Pursuit Deemed a Factor in the Aggravation of a Mycotic Dermatitis.

Many of these types of eruptions no doubt originate in the skin independent of any occupational factor, but the latter hastened its development and at times produced a superimposed dermatitis venenata. Chemicals especially played an important role in this group, whether from irritation or changing the biological background, it is difficult to say.

There were 29 patients in this category.

Case 2. A man aged 25 had had recurring "eczema" of various interdigital areas of hands for a number of years—not enough to consult a physician. During the past summer he took a position with a chemical manufacturing company handling a great many different preparations—several of which contained varying amounts of aniline dyes would cause a marked exacerbation of the eruption. When first observed he presented large number of deep seated vesicles on all parts of the fingers and palms. The alkali preparation was positive for short hyphae; antimycotic preparations eventually cleared the eruption.

In this type of cases the two factors are interdependent, the occupational factor here being definitely an aggravating influence. In these cases a superimposed dermatitis venenata is often present which has to be treated first with soothing preparations.

Group 3. The Fungus Infection Considered a Complication of a Pre-Existing Injury or Irritation or Contracted by Occupational Contacts.

Two striking typical cases can be cited out of seven placed in this group.

Case 3. Mr. S., aged 60, foreman of a stone quarry (patient of Dr. A. W. Stillians), was bruised on the left foot and ankle in May, 1928, "skinned," as the patient described, which healed in three days. Several weeks later "blisters" appeared in injured area and gradually spread down toward the toes. In a short time he had a bilateral inguino—crural eruption consisting of erythemato-scaling areas accompanied by considerable itching; many vesicles appeared on sides of fingers. When observed several months later discrete erythemato-scaling areas were present in the regions mentioned—no vesicles were found. Scales from the left ankle and sides of fingers showed many long hyphae.

Here it was decided that the injured region was an area of lowered resistance and favored fungus infection. That his skin was favorable to mycotic growth was shown by involvement of the several intertriginous areas.

Thus injury may be a factor in lowering the local resistance; a preceding dermatitis venenata from external irritants can do likewise.

Case 4. A man, aged 29, a janitor, had an acute dermatitis venenata of hands following the use of a soap powder. He gave a history of no previous skin trouble. When first observed, he presented a severe bullous dermatitis of hands, quite characteristic of a dermatitis venenata. Soothing treatment was instituted. Marked improvement occurred and then numerous deep seated intradermal vesicles occurred on sides of the fingers. Mosaic type of fungus was found and institution of antimycotic remedies cleared the eruption.

That deep fungus infections may occur following injuries is well known.

Case 5. A man, aged 58, a furniture factory employee (patient of Dr. A. W. Stollians), had a laceration on back of right hand—several days later had similar injury and had not healed in two months' time. On examination the area of the size of a dollar had many papillary projections with pus oozing here and there. Examination of pus showed blastomycetes to be present. Treatment with x-ray and potassium iodide internally were employed with a good result.

Blastomycetic infection of the deep Gilchrist type should not be treated surgically because of possibility of serious general dissemination. Other fungi which are ordinarily deep invaders as sporothrix and actinomyces may assume occupational importance.

TREATMENT

The patient should be informed that this superficial mycotic dermatitis is an infectious and contagious disease and can be communicated to susceptible contacts and even to a greater extent, auto-inoculable.

The main principle of treatment is caution against using too strong preparations which will set up an eczematoid dermatitis which may last for months. If any venenata element is present, that must be first treated.

The number of preparations used in treating superficial fungus infections are legion—almost every dermatologist has a long list. This acknowledgment in itself proves that really none are always specific. In our present state of lack of knowledge of the causative fungi, it is difficult to crystallize our therapeutic armamentarium. As the cultural aspects of the fungi are studied more, this knowledge may be sifted from purely scientific to actual clinical usage.

Local preparations are the most important and a few of the better known drugs will be cited; in the main 1, wet dressings, e. g. potassium permanganate in various dilutions, especially 1:8000, are useful in the acute stages; 2, crude coal tar and Whitfield's ointments are efficacious

in the subacute and chronic stages. The crude coal tar must be properly washed and prepared to avoid having irritating qualities. The formula used a great deal at the present time is that of the originator, Dr. Charles J. White of Boston, and consists of two parts of crude coal tar, two parts of zinc oxide, both incorporated in 32 parts of petrolatum. Whitfield's ointment has salicylic and benzoic acids as its active constituents; the strength of each are given in varying percentages in the standard textbooks. Whitfield,[13] himself, states the preparation to be as follows, viz: 25 grains of benzoic acid, 15 grains of salicylic acid, two drams of paraffin molle, in olei cocois nucis to make one ounce. This ointment usually produces better results in weaker strengths, although it can be used even stronger in hyperkeratotic types. The active ingredients are usually incorporated in petrolatum in this country. Various fungicides, e. g. sulphur, etc. may be added to the latter. Certain volatile oils and stearoptens as oil of cinnamon and thymol are occasionally very helpful in alcoholic solutions as shown by Myers and Thienes.[14] Use of proprietary preparations should be discouraged because one should use varying strengths to suit the individual needs.

X-ray treatments in fractional doses usually decrease the subjective symptoms; occasionally the relief is only temporary. Ultra violet lamp does seem to help the more chronic cases.

The best results are obtained by seeing the patient frequently in order to change the therapy as necessary. Experience in these cases has taught me that the judicious alternation of a few remedies brings better results than the use of a large number indiscriminately prescribed.

Mode of Infection. The mode of fungus infection, the spread from one patient to another and the possibility of one worker acting as a carrier in infecting others are subjects which cannot be discussed with finality. There is no reason why a person with such fungus eruption cannot act as a focus of infection for his co-workers; epidemic of furuniculosis are sometimes believed to be caused in such a manner. Whether routine medical inspection of workers would be a help is hard to say because so many people have intertriginous foci between the toes, which never assume any importance. Charles J. White[15] has enumerated some of the most common sources of infection, viz.: woolen clothes of all kinds, shower bath floors, towels, leather, sponges, suspensories, bandages and athletic goods. He was impressed with the fact that persons do not easily get this disease directly from one another; it seems that an inanimate object must form a connecting link between man and man. It is difficult to sterilize these inanimate objects; probably hot steam is the best. The factor of individual human susceptibility is another point to keep in mind; probably susceptibility is just as important as the specific organism.

SUMMARY

Superficial fungus infections occur on the extremities in industrial workers. Three divisions of such patients are apparent; one class in which the infection is independent of the patient's occupation; a second in which the patient's work is a definite factor in aggravating, and third, in which the fungus invasion is secondary to previous trauma or injury from irritating substances or results from occupational contacts.

A series of 48 such cases was encountered in a clinical and laboratory examination of 912 patients suffering from superficial dermatoses considered of fungus etiology. These patients had eruptions of the extremities in which fungi were found miscroscopically, and an attempt has been made to evaluate their importance in the cutaneous manifestations. All stubborn unexplained eczemas of the extremities in industrial workers should be examined for fungi.

It should be borne in mind that such eruptions can make a skin susceptible to irritants, thus enhancing the possibilities of dermatitis venenata. Furthermore, in the lowering of local cutaneous resistance, entrance of pyogenic bacteria can occur. Secondary to an injury, deep fungus infections can occur which may be a very serious complication. Thus these superficial fungus infections and their sequelæ are able to incapacitate a person from a few weeks to many months.

Various fungicides are used in treatment; great care should be exercised not to overtreat with strong preparations. A few remedies properly used seem to produce better therapeutic results than the endeavors to employ a large num-

ber of various preparations. The patient should avoid possible fungus contacts to avoid recontamination from improperly sterilized articles.

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ACUTE APPENDICITIS IN CHILDREN

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My only excuse for adding to the already voluminous literature on appendicitis is that on looking over the records of my cases I find that an analysis of the symptoms and physical findings of acute appendicitis in children is vastly different from that in adults. Acute appendicitis in adults is so frequently seen and the picture so indelibly printed in our consciousness that the absence of the cardinal symptoms and signs tends to blunt our perceptions. Yet in children it is vastly more important to make an early diagnosis of an acute intra-abdominal condition than in adults. General peritonitis is much more fatal than in adults and the ability of the peritoneum to localize an abscess is not nearly so great. Moreover, a diagnosis must be made often without the intelligent co-operation of the patient, and in a patient who wishes most of all not to be examined and molested. And commonly a great part of the history must be obtained from the parents and is at best fragmentary and inaccurate.

In twenty-one cases of appendicitis in children of twelve years old or less operated upon during the past few years, nineteen were operated upon during an acute attack, one in the interval between attacks, and one in the presence of a large post appendiceal abscess. These two cases are included in my tabulation as one case was seen during an acute attack and the other gave a clear history.

In eleven cases the pain was referred to the right lower quadrant of the abdomen. In four cases the pain was over the abdomen generally, in three over the lower abdomen, in one in the epigastrium, in one over the entire right side, and in only one in the epigastrium and later localizing in the right lower abdomen. In general the older children gave a more accurate localization of the pain. In six cases the pain was characterized as severe—all of these had either a gangrenous appendix, an appendix filled with pus, or free fluid in the abdomen. Two cases with gangrene and four with free fluid showed only moderate pain. Of these, three were twelve years old, one nine, one seven, and one five.

Nausea was present in all cases except one. This case was twelve years of age, had a temperature of 98.4°, a leucocyte count of 11,000, and gave a history of one or two severe attacks of abdominal pain yearly for five years. These attacks lasted for several days. There was no tenderness. In addition, she complained of abdominal pain in the right lower quadrant, cramp-like in character, coming on from one-half to four hours after violent exercise, as in gymnasium. A diagnosis of appendicitis was made and at operating—supposedly between attacks—a large acutely inflamed appendix was found with free fluid in the abdominal cavity. Vomiting was absent in two other cases, each with an acute inflammation and free fluid.

Fever was present in eighteen cases and absent in three. It ranged from 98.8° to 103°. In six cases only was it over 100°, and in only one of these cases was the appendix gangrenous although in three of them free fluid was present. Four other gangrenous cases showed temperatures ranging from 99.2° to 100°. In

the three cases in which fever was absent, in two it was below normal. Both of these were very acute, one with free fluid and one with many old adhesions. The average temperature for all cases was 99.8° at the time of operation.

Tenderness was present in nineteen cases, in two no tenderness could be demonstrated. In five it was termed acute; of these four were gangrenous and one contained free fluid. Of the one remaining gangrenous case, the four with free fluid, and the one with pus in the appendix itself, tenderness was moderate. All complained of some tenderness generally, but these nineteen complained of more tenderness over the right lower quadrant than over the rest of the abdomen.

The leucocyte count was in general not reliable as to the presence of infection, although three of the five gangrenous cases had counts from 17,750 to 21,000. The two others were 13,000 and 14,800. The case with pus was 11,600. These with free fluid ran from 9,600 to 15,200 with an average of slightly more than 12,000. Of the others the highest was 16,800, the lowest 7,000 and the average 12,200. The average of all cases was slightly less than 13,400. Several of the most severe cases had less than 13,000 and three less than 11,000.

Fourteen cases were seen in the first attack, of these four were gangrenous, one contained pus and three free fluid. Of the remaining seven cases, two had had "many" attacks, two "several", one had had six in the year previous to operation, one three or four in six months, and one had had one or two attacks yearly for five years. These attacks had been similar to the ones for which they were operated upon and several cases had had a diagnosis of appendicitis made during a previous attack.

In the eighteen cases operated upon during the acute attack, one was sick for four hours, and two for five days before receiving medical attention. The average length of time was slightly less than two days. Probably many of these children were sick before the fact became known to their parents. The one sick for four hours had free fluid, a temperature of 99.6° and a white count of 12,600. Of the two sick for five days, one had a temperature of 98.8°, a white count of 16,800 and a very acutely inflamed appendix. Of those in whom the appendix had become gangrenous, one had been sick for twelve hours, one for two days and the remaining three for one day.

Of the three remaining cases one had been sick for six weeks. The diagnosis rested between an appendiceal abscess and tubercular peritonitis with the probability that the appendix was the source of trouble. The child was markedly distended, emaciated and in poor condition. At operation an abscess filling practically the entire pelvis was opened and evacuated. The cecum was bound down and no attempt was made to find the appendix. The child, nine years old, recovered uneventfully.

The other two were interval operations. In one with a temperature of 98.8°, a white blood count of 11,000, no tenderness and no pain, a moderately acute appendix was found. This child gave a history of pain after exercise. The last case had been seen previously in an acute attack and refused operation. Several more attacks occurred before operation. At operation, a large appendix was found with a short mesoappendix and many dense adhesions to the cecum.

In this series there were eight children of twelve years, two of five years and three of six years. The average age was nine years and three months. Eight were females and thirteen males. Five of the cases had pain following exercise. In one, the first attack came on after three hours of swimming. In the remaining four, there had been previous attacks and two showed dense adhesions. One case forty-eight hours after operation developed a chill, cough, pain in the chest, rusty sputum and consolidation in his left chest. Two cases showed one large lymphatic gland at the base of the appendix. Both of these cases had a very acute inflammation.

Of the appendices themselves, five were gangrenous, one contained pus, and fifteen were acutely inflamed. Of the latter, six were accompanied by free fluid in the abdominal cavity, ranging from a small amount of clear fluid to a moderate amount of slightly turbid fluid. The cases with fluid appeared more acutely ill than those without fluid, although the physical findings were no more alarming. In these cases,

too, the appendix was more edematous and the vessels more markedly injected. Two cases followed several days after an acute throat infection and quite possibly were secondary infections. Both of these had free fluid.

In five cases the appendix was adherent to the cecum. In one of these the adhesions were recent and this the first attack. One appendix was very long, had almost no meso-appendix and a definite stricture of the lumen. This child was five years old, had been sick five days with intervals during that time at which she appeared to be well. Two white blood counts made showed when without pain 8,000, and when with pain 11,200. It is likely that the appendix filled up and discharged into the intestine. One other case had a stricture of the lumen. Three of the remaining four adherent cases gave a history of many previous attacks. The fifth case was gangrenous and although no history could be obtained of previous attacks the child was but six years old and may have had several. Only one case had a fecal concretion. In four cases only could a mass in the appendiceal region be palpated. All cases except the appendiceal abscess were closed without drainage and all recovered.

Ordinarily the older the child, the more easily the diagnosis. The exclusion of pyelitis is particularly necessary in small girls. Right lower lobe pneumonia, psoas abscess and, especially in infants, colic and intussusception must be differentiated.

CONCLUSIONS

1. Any child with acute abdominal pain, vomiting, even slight tenderness over the lower abdomen, a moderate fever and leucocytisis should be considered to have acute appendicitis unless other definite pathology can be found to account for these symptoms.

2. A very slight fever and leucocytisis in the presence of other symptoms is no indication that acute appendicitis is not present.

3. In acute appendicitis the severity of the infection can not be determined from the symptoms and physical findings.

4. The presence of a comcomitant infection which may account for some of the symptoms should not hide the fact that acute appendicitis may be present at the same time.

5. The younger the child the more necessary it is to exclude acute appendicitis.

6. The treatment of acute appendicitis in children, however mild the attack may seem to be, is immediate operation.

VISUAL AND AUDITORY EFFICIENCY IN SCHOOLS, INDUSTRY AND COMMERCE

C. F. YERGER, M. D.
CHICAGO

In order to determine the incidence of defective vision and hearing in the schools, industries and in commerce, a questionnaire was sent to various representatives of the same in Illinois and throughout the country. A summary of the answers to these questionnaires follows:

1. PUBLIC SCHOOLS

a. *Defective Vision.* Fourteen Illinois cities submitted data on the percentage of defective vision of the children of the public schools, which ranged from 5 to 44 per cent. and in each case was 5, 5, 6, 6, 7, 10, 12, 13, 18, 21, 25, 31, 40 and 44 per cent. (The preponderance of the percentages below 15 per cent. is explained by the manner in which the visual acuity tests were done as many of these tests were made by teachers and nurses who are not efficient in this respect.) Eight cities reported that the physical examinations were made by nurses among which is Champaign where 5 per cent. were found with defective vision. In Evanston, in 1927, the school physicians made 3,526 physical examinations and found defective vision in 21 per cent. of the school children. The Chicago Health Department states that about 25 per cent. of the school children have defective vision. The tendency of visual defects to increase from the lower to the higher grades is shown by Mason county where defective vision was found in 23 per cent. of the high school and in 14 per cent. of the grade pupils.

Nine cities outside of Illinois reported defective vision varying from 7 per cent to 28 per cent. as follows: 7, 7, 8, 10, 10, 16, 18, 24 and 28 per cent. In Philadelphia, the percentage of defective vision varied from 1.5 per cent. to 24 per cent., according to the standard used by the various examining physicians. A very careful study of the vision of 7,637 school children of Jamestown, N. Y., was made; 18 per cent. had

a refractive error and 10 per cent. squint. In a recent study of the vision of 2,000 school children by the Public Health Service, it was found that 45 per cent. needed glasses.

b. *Defective Hearing.* Ten Illinois cities reported defective hearing which ranged from .04 to 6 per cent. as follows, .04, 0.1, 0.5, 1, 1, 2, 2, 3 and 6 per cent. (The low per cent. of defective hearing found was due to the method of testing.) It is noteworthy that the audiometer was not used in the testing of auditory acuity in the public schools of Illinois.

Eight cities outside of Illinois reported defective hearing varying from 0.2 per cent. to 20 per cent. In the Philadelphia schools, the percentage of defective hearing was from 0.2 per cent. to 1.5 per cent. with the voice test and 14 per cent. with the audiometer; in Detroit it was 0.8 per cent. with the voice and 20 per cent. with the audiometer.

In Syracuse, where a visual and auditory survey was recently made under the supervision of an ophthalmologist and an otologist, 4,021 pupils of the public schools were examined. This work was done through the co-operation of the department of health with the public schools and is an excellent example of what can and what should be done in every city. The work was done efficiently and scientifically. The visual survey consisted of ophthalmological examinations which included besides the visual acuity test, the examination of the eyes, including the fundus. 16.3 per cent. had an error of refraction; 9.5 per cent because of poor vision and 6.8 per cent. had asthenopia A study of these cases show a steadily increasing number of visual defects from the lower to the higher grades. A study of scholarship as related to poor vision seemed to indicate that poor scholarship was due to lack of mental ability rather than to poor vision or asthenopia. In the auditory survey the hearing test was done with the audiometer, which allowed group testing. 11.3 per cent. were found with impaired hearing, *i. e.*, a hearing loss of 9 or more sensation units; of these, 9.5 per cent. were classified as mild, *i. e.*, a hearing loss of 9 to 12 S. U.; 1.2 per cent. as moderate, i. e., a hearing loss of 15 to 21 S. U., and a severe in 0.6 per cent. *i. e.*, a hearing loss of 24 to 30 S. U. The survey established that diseased tonsils and adenoids were mainly responsible for defective hearing in children, but no report is yet available on the correction of defects and its influence on defective hearing.

In a test of hearing given to 10,367 pupils and 334 teachers in the public schools of Gary, Indiana, by means of the 4-A audiometer, equipped with 40 headphones, conducted by a nurse who was especially trained in this work, it was found that 1,054 had a loss of 9 or more S. U. in one ear, 592 in both ears; 3,306 pupils were retested and 164 were listed for special examination by an aurist.

The Chicago League for the Hard of Hearing, for the past two years has been making a survey of hearing in the Chicago public schools and thus far over 20,000 pupils have been examined. It was found that on the average two children in each classroom are in need of immediate medical attention to correct defective hearing; one child in each classroom has been neglected until he is already hard of hearing, and four children in each room do not hear as well as they should, though the cause may be of minor importance.

2. Universities

Sixteen universities replied to our questionnaire. All require physical examination of students.

a. *Defective Vision.* Data was available and submitted by 9 universities on the incidence of defective vision. Defective vision average 46 per cent. and varied from 12 to 71 per cent. In each case, it was recorded as follows: 12, 16, 29, 30, 31, 32, 37, 55 and 71 per cent. At the University of Illinois it was found that 55 per cent. of the students had defective vision and of these 42 per cent. were men and 67 per cent. were women. At Cornell University, it was found that 71 per cent. had defective vision and 31 per cent. of these wore glasses. 90 per cent. of the students at the University of Michigan are refracted by an ophthalmologist; it was found that 45 per cent. had properly fitting glasses. In but two instances were there any figures available regarding the improvement of vision with glasses. Harvard University stated that in 8 per cent there was no improvement with glasses. The University of Illinois reported that vision was corrected in 86 per cent. of the women and

in but 6 per cent. of the men that had defective vision.

b. *Defective Hearing.* Data was available and submitted from but 7 universities on the incidence of defective hearing, the per cent. in each case being .002, 2, 2, 3, 3, 3, and 19 per cent. There were but two answers to the question as to whether there was any improvement in hearing after treatment and these were in the negative.

3. Industry

Thirty-two of the large industrial concerns throughout the country replied to our questionnaire. Twenty-seven of these have medical departments, 22 made physical examinations of their employees, 12 make periodic health examinations, six had visual surveys made, three by ophthalmologists and three by optometrists. None had an auditory survey.

In reply to the question as to the percentage of defective vision among their employees, but 10 replied and this varied from 1 to 52 per cent. in each case being 1, 1.5, 3, 3, 8, 8, 17, 20, 25 and 52 per cent. The great variation in the results of the visual acuity tests is accounted for by the different standards required by the various industries. Only 10 replies were received concerning the percentage of defective hearing found; these were 0.25, 0.50, 0.60, 1 and 1 per cent.

4. Railroads

Twenty-three of the large railroad systems responded to our questionnaire. All have medical departments which make physical examinations of new employees. Periodic health examinations are made which vary from a complete physical examination to special examination for visual acuity, color sense and auditory acuity. These examinations vary in frequency from yearly to every two, three or four years.

Unfortunately, no statistics were available or obtainable from the railroads pertaining to the percentage of visual or auditory acuity, with the exception of the Chicago and North Western Railroad. In 1927 the medical department made a thorough and complete physical examination of nearly 10,000 men. It was found that 1,988 or 20 per cent. had visual defects and 10 per cent. had defective hearing. 70 per cent. of the passenger train conductors and 41 per cent. of the engineers had defective vision. The defective vision of practically all of the employees were corrected by glasses.

I wish to acknowledge and express my appreciation for the services rendered by the Educational Committee of the Illinois State Medical Society without whose aid it would have been impossible to make this survey, also Miss Jean McArthur, the secretary, for her efficient cooperation.

4458 Madison Street.

PRACTICAL PROCTOLOGICAL POINTERS

William A. Hinckle, M. D.

PEORIA, ILLINOIS

True hemorrhoids have their origin in the rectum above the ano-rectal line, so are covered with mucous membrane, not with skin.

Do not attempt to replace a hemorrhoid that is covered with skin. Such tumors do not belong inside and would not stay if it were possible to place them there.

A painful tumor or "pile" developing quickly at the verge of the anus and covered with mucocutaneous tissue is nearly always thrombotic in origin. Such tumors can not be replaced. They are quickly cured by enucleation of the clot and sac.

All hemorrhoids do not protrude on defecation. When small they may prolapse only sufficiently to produce a sensation of fullness or a partial obstruction with constipation.

A redundant and relaxed rectal mucosa may also prolapse sufficiently to obstruct the anal opening thus giving rise to constipation and fecal accumulation.

"Itching piles" is a misnomer. True hemorrhoids do not itch; and anal itching and hemorrhoids seldom exist in the same patient.

True pruritus ani is usually due to intestinal putrefaction or fermentation engrafted on some minor local pathology. That is why ointments do not cure such conditions.

Pain during and after defecation is very suggestive of rectal fissure.

Don't forget that a thorough rectal and anal examination will often disclose the cause of those obscure backaches with pain radiating down the back of the thighs.

Don't overlook inflamed crypts, unhealed fis-

tulae and other rectal pathology as foci of infection.

When mucus and blood appear in the stools, do not hastily diagnose colitis, or bleeding piles. Make an examination, you may find a cancer.

No physical examination is complete without an examination of the rectum.

Do not underestimate the hot Sitz as a paliative for various types of rectal and anal pain and inflammation.

629-30 Jefferson Building.

THE DOCTORS

I like to talk with business men, with bankers and with clerks,
And I can spend a pleasant hour with any man who works,
I like to talk with lawyers, and with artists now and then,
But still I think I'm fondest of a certain class of men.
I think, although with any man I'm glad to share a jest,
The doctors are the ones I really like to talk to best.
The doctors have so much to tell I want to know about,
I like to hear the surgeons talk of what they've taken out;
The brains and lungs that day removed from women and from men
And all the marvelous things they've done to make them well again.
It may be I am strange in this, but I can sit all day
And listen to the wondrous words a doctor has to say.

When comes my doctor in to me to sit beside my bed,
Although I've called him in to work, I hope he'll talk instead.
I like to hear the things he knows, the things he's done and seen,
For I am curious about this flesh and blood machine.
And though he is a busy man, I make him earn his fee
By getting him to sit and talk an hour or two with me.

Now bankers talk of money, and your artists talk of art,
And there's a sort of wisdom in the knowledge they impart,
But doctors talk of life and death, the cause and cure of pain
And there's a fascination in their speech that I can't explain.
I like to talk with doctors, and I hold their friendship great
But I hope they'll never say to me: "I guess we'll operate!"

—Edgar A. Guest.

SEVERAL OBSERVATIONS CONCERNING THE ACTION OF LIVER DIET ESPECIALLY ON THE BLOOD CHOLESTERIN

A. Adler and L. Schiff (Deutsch. Arch. f. klin. Med., 161:282, 1928).

The influence of liver diet on various bile constituents was investigated. In patients with pernicious anemia it was shown that the cholesterin went up considerably following discontinuance of liver diet and renewed administration of liver. In order to be sure that the rise of colesterin in the serum was not of alimentary origin, a liver extract was used, which was free from this lipoid. The administration of the liver extract also had as result in the healthy human being a considerable rise of the cholesterin picture of the blood. The authors conclude from their findings that the duration of life of the red blood cells is probably lengthened under the liver therapy, without the new formation being limited at first. In normal human beings just as in patients with pernicious anemia there occurred a rise of hemoglobin, of erythrocytes, or reticulocytes, and of eosinophils. In contrast to pernicious anemia the serum bilirubin picture and the urobilin content of the stool increased. In patients with pernicious anemia and with liver disease a rise of blood sugar is to be observed following a single administration of liver extract. Color of the urine frequently becomes fluorescent green-yellow with liver therapy.

FAVORABLE EFFECTS OF LIVER DIET IN NEPHROSIS

R. Bauer (Zentrlbl. f. innere Medizin. 49:1135, 1928).

A favorable action was obtianed with liver therapy in nephrosis. In nephropathic cases during pregnancy, accordingly, not only is a favorable influence of liver therapy on the diseased condition to be expected but also a positive diagnostic orientation, which might lessen the difficulty of differential diagnosis.

Marriages

HOWARD DICK COUNTRYMAN, Rockford, Ill., to Miss Virginia Clark of Evanston, July 1.

EUGENE A. EDWARDS to Miss Beulah Eleanor Casler, both of Chicago, June 30.

PALMER W. GOOD, River Forest, Ill., to Miss Elvina Oberhelman, June 22.

WALTON E. RICHBURG, Chicago, to Miss Helen Mehl of Peoria, Ill., July 27.

JACOB SCHERMER, Granite City, Ill., to Miss Lillian Tenenbom of Davenport, Iowa, July 7.

ALVIN STEWART THURSTON to Miss Mary Planert, both of Chicago, June 18.

ISAAC VANDERMADE to Miss Ellamay Renkes, both of Morrison, Ill., June 29.

Personals

Dr. Ernest L. Motsinger has been appointed health officer of Freeport to succeed the late Dr. Elmer H. Best.

Dr. Robert M. Sutton is the tennis champion of Peoria County, according to the *Bulletin* of the Peoria Medical Society.

Mrs. Dellora Angell Norris has given $100,000 to the city of St. Charles for the construction of a community hospital.

Dr. Robert E. Flannery, Surgeon St. Mary of Nazareth Hospital, has been appointed Surgeon to Alexian Brothers Hospital, taking the place vacated by Dr. Hessert. Dr. Flannery has just returned from a four months' visit to the surgical clinics of England and Germany.

Dr. Charles H. Pelton, who has been appointed assistant superintendent of the Boston City Hospital, assumed his new duties about August 15.

Dr. Emil K. H. Oelke, Wheaton, won the annual Du Page County Medical Society Golf Tournament, in which twenty-two physicians participated.

An oil painting of the late Dr. Daniel M. Ottis is to be presented to St. John's Hospital, Springfield. The portrait was painted by Thomas Lockie of Pontiac.

Dr. Edmund Andrews, associate professor of surgery at the University of Illinois, has been appointed associate professor of surgery in the clinics of the University of Chicago.

Dr. Sumner N. Miller has been appointed head of the medical staff and Dr. Argal E. Hubbard as superintendent in charge of the Peoria Municipal Tuberculosis Sanitarium.

Dr. and Mrs. Warren E. Taylor, Moline, celebrated their golden wedding anniversary, August 5. Dr. Taylor formerly was superintendent of the East Moline State Hospital.

Dr. Herman M. Adler, state criminologist, has been appointed consultant to President Hoover's commission on crime and law enforcement. He will be relieved for a time from duty as state criminologist.

Miss Bertha Kaplan was awarded the annual Beaumont Memorial Fund prize ($100) at the commencement of the University of Illinois College of Medicine for her study of ameba carriers in Chicago. The prize fund was created in 1926 by Dr. Frank Smithies.

Dr. George D. Heath, Jr., formerly health commissioner of Bloomington, has been appointed health officer of Florence, S. C., succeeding the late Dr. Percy H. Brigham.

Governor Emmerson has appointed Dr. Sidney D. Wilgus, proprietor of a sanatorium in Rockford, as state alienist for four years to succeed Dr. Alexander S. Hershfield of Chicago. Dr. Wilgus was formerly superintendent of the state hospitals at Elgin and Kankakee.

For fifteen years Dr. Wilgus was connected with the New York State Service; in 1916, he made a survey of all eleemosynary institutions of the state of Tennessee for the national committee of mental hygiene; the same for Connecticut in 1916; for Indiana in 1917; and for New Jersey in 1920. He is a member of the Chicago Neurological Society and of the American Psychiatric Association.

Dr. Stanhope Bayne-Jones, professor of bacteriology, University of Rochester School of Medicine, gave a public lecture at the University of Chicago, August 8, on "Motion Pictures in the Study of Microbiology;" Robert G. Gustavson, professor of chemistry, University of Denver, spoke on "The Female Sex Hormone."

Governor Emmerson has appointed the following physicians members of the board of public health advisers: Dr. James T. Hutton, president-elect, Chicago Medical Society; Dr. Arnold H. Kegel, health commissioner of Chicago; Dr. William A. Evans, former health commissioner of Chicago; Dr. Clifford U. Collins, Peoria, and Dr. Rufus J. Coultas, Mattoon. These members serve without pay.

Dr. H. H. Fletcher of Winchester, has been appointed managing officer of Illinois Soldiers and Sailors Home in Quincy.

Dr. C. H. Diehl has resigned as superintendent of Lincoln State School and Colony.

News Notes

—The new St. Therese Hospital in Waukegan, costing about $1,250,000 and containing 250 beds, has been dedicated.

—The cornerstone of the new $500,000 addition to St. Francis Hospital on Ridge Avenue, Evanston, which will accommodate 100 additional patients, was laid, August 15.

—The state department of health, August 21, reported that 5,950 persons were accidentally killed in Illinois last year. The principal causes

were automobiles, 1,745; falls, 961; railroad mishaps, 662; burns, 416; drownings, 383; injury by machines, 139; street cars, 184; firearm wounds, 133; poisoning, 131.

—True bills were voted by a grand jury, July 30, naming five men as members of a gang that sold licenses to applicants who were not properly qualified to practice medicine. Those indicted are reported to be: W. H. H. Miller, former director of the state department of education and registration; L. Mitchell Blaine, who posed as a physician; Harry Goldstein, alias Senator Browski, of Springfield; Albert Barron, a prospect finder, and John Torbert.

—The decrease in the birth rate in Chicago has been less than 15 per cent, while that for the U. S. Registration Area as a whole has declined more than 17 per cent, according to the Chicago School of Sanitary Instruction. This decline in the birth rate has been offset by a decrease in the infant mortality rate from 108 per thousand births in 1915 to sixty-six in April of this year, or 38.7 per cent. In the last calendar year, 59,016 babies were reported born in Chicago.

—The one hundred and eighth medical regiment attached to the thirty-third division left for the annual encampment at Camp Grant, August 3. The regiment has two ambulance companies, a hospital company, a service company, the division surgeon's staff, and regimental headquarters. Col. James J. McKinley is in command. Its medical officers are members of the Chicago Medical Society. Reserve officers were attached to the regiment for training during the encampment.

—From 1918 until 1928 the cancer death rate of Illinois rose from 2 to 4 per cent each year, the total increase having been about 30 per cent, or from 82 per hundred thousand of population to 106. The number of deaths reported as due to cancer in Illinois in 1928 was 7,887. The state health department, in studying these reports, says that cancer among fat persons is higher than among underweight people or persons of normal weight. The stomach was the seat of cancer more than twice as often as any other organ.

—The medical staff of the state department of health has examined all school children in Mason County for physical defects. On the basis of these examinations, the department estimates the number of physical defects in the 1,125,000 children in Illinois who will soon return to the classroom. The department says that 935,000 of these children will have defective teeth; about 562,000 defective throats with enlarged tonsils predominating, and 235,000 some form of defective vision, while 800,000 will not have been vaccinated against smallpox nor immunized against diphtheria.

—The health commissioner of Chicago, Dr. Arnold H. Kegel, sent out notices to 1,500 bakeries, July 29, restricting the use of cream filling in cakes and other bakery goods for the next six weeks because of the ease with which such filling becomes infected in the hot weather. The health department has received reports in the last two months of 153 cases of illness due, it is said, to the eating of infected "cream filling" in bakery goods. An outbreak of food poisoning was reported, July 28, that was believed to have been due to eating coffee cake. At least twenty-nine persons were affected, only one of whom became seriously ill. The bakery that supplied the cake was closed and an investigation undertaken to determine the cause.

—A campaign has been launched to rescue Chicago's great hospital district on the west side, said to be one of the greatest in the world, from its squalid surroundings by having the territory around it made into a park district. A committee, representing the west side medical institutions, proposes to have the city acquire possession of all nonmedical property from Van Buren Street to Roosevelt Road and from Paulina Street to Ogden Avenue and to remove the poor type of building now on the grounds and convert the surrounding property into a park. The spokesman for the committee was Asa Bacon, superintendent of the Presbyterian Hospital. The county commissioners, the West Town Chamber of Commerce and unofficially the Chicago Plan Commission have approved the plan. The proper care of the sick in this area necessitates providing better surroundings. With this improvement will come the expansion of the institutions. In this area are the county hospital, Presbyterian Hospital, University of Illinois College of Medicine, Rush Medical College, Loyola University School of Medicine, dental schools, laboratories and other hospitals. The plan will be placed before the public in the hope that it will approve a bond issue.

—Through arrangements made in a conference between the office of the state's attorney, represented by Mr. Bellows, the department of registration and education, represented by Mr. Clyde I. Backus, Chief of Police Russell, and representatives of the American Medical Association, the police department of Chicago attempted to secure during the last week in August, a record of every person in Chicago who undertakes to heal the sick, including name, address, type of healing practiced, school and year of graduation, and year and method of licensure. The cards will be checked through the state department of registration and education and at the headquarters of the American Medical Association to determine the nature of practice now going on in Chicago and the number of persons practicing without a license.

Deaths

Dorwin Deloss Barr, Taylorville, Ill.; Miami Medical College, Cincinnati, 1890; a Fellow A. M. A.; formerly secretary of the Christian County Medical Society; aged 73; died, August 9, of a skull fracture received in an automobile accident.

Oscar Carl Breitenbach, Waukegan, Illinois; University of Michigan, 1903; a Fellow A. M. A.; Fellow of the American College of Surgeons; member of the American Academy of Ophthalmology and Otolaryngology; member of the Indiana Academy of Ophthalmology and Otolaryngology; member of the Chicago Laryngological and Otological Society; Secretary of the Attending Staff of the Victory Memorial Hospital; member of Staff of St. Therese's Hospital; consulting oculist and aurist Lake County General Hospital; medical examiner for the Aeronautics Branch of the Department of Commerce; aged 51; died, August 14, of pneumonia and carbuncle of the lip.

John Adams Chaffee, Oakwood, Ill.; Medical College of Indiana, Indianapolis, 1897; aged 60; died, June 23, at St. Elizabeth's Hospital, Danville, following an operation for removal of the prostate.

Joseph Samuel Cohn, Chicago; University of Illinois College of Medicine, Chicago, 1910; a Fellow A. M. A.; formerly instructor in pediatrics at his alma mater; associate attending pediatrician to the Mount Sinai Hospital and attending dispensary physician to the City of Chicago Municipal Tuberculosis Sanitarium; aged 43; died, July 23, of sinus thrombosis, following mastoidectomy.

James Wilson Connelly, Farmington, Ill.; Rush Medical College, Chicago, 1890; aged 67; died, July 14, of heart disease.

William Henry Fox, Chicago; Victoria University Medical College, 1886; aged 69; died, July 29, of angina pectoris.

Charles Edwin Jones, Oak Park, Ill.; Miami Medical College, 1874; Bellevue Hospital Medical College, New York, 1876; practiced in Chicago until his retirement in 1926; aged 78; died suddenly, July 29, of heart disease.

Stephen W. Jones, Danville, Ill.; Medical College of Ohio, Cincinnati, 1878; a practitioner in Vermilion County for 56 years; aged 77 years; died August 8, of heart disease.

Samuel S. Kehr, Sterling, Ill.; General Medical College, Chicago, 1884; aged 76; died suddenly August 10, of heart disease, while attending a patient.

Henry Foster Lewis, Wooster, Ohio; Harvard University Medical School, Boston, 1888; a Fellow A. M. A.; professor of physical diagnosis, College of Physicians and Surgeons, Chicago, 1891-1903; associate, instructor and assistant professor of obstetrics and gynecology, Rush Medical College, Chicago, 1899-1907; professor and head of the department of obstetrics and gynecology, Loyola University School of Medicine, 1910-1918, and formerly professor of obstetrics at the University of Illinois College of Medicine; served during the World War; in 1895 curator of the museum and for many years on the staff of the Cook County Hospital; aged 65; died, August 5.

John T. Lloyd, Baldwin, Ill.; Keokuk (Iowa) Medical College, 1891; member of the Illinois State Medical Association; aged 64; died, July 7, as the result of a cerebral hemorrhage.

John J. Muldoon, Chicago; Northwestern University Medical School, 1894; formerly chief of staff of St. Vincent's Hospital; chief medical examiner of Catholic Order of Foresters; member of staff of Alexian Brothers Hospital; aged 63; died, August 22, of carcinoma of stomach.

George Darwin Prewitt, Peoria, Ill.; Missouri Medical College, 1890; aged 68; died, August 5, of chronic nephritis.

Lawrence Edward Sleeper, Chicago; Northwestern University Medical School, Chicago, 1904; a Fellow A. M. A.; member of the Nebraska State Medical Association; aged 51; died, May 25, of paresis.

William T. Sloan, Peoria, Ill.; Bellevue Hospital Medical College, 1874; member staff of Proctor and St. Francis Hospitals; aged 80; died, August 1, following invalidism of three years on account of fracture of the hip.

Charles P. Spann, Thebes, Ill.; College of Physicians and Surgeons, Keokuk, 1888; aged 80; died, July 28, of heart disease.

Grant Arnold Stockdale, Coal City, Ill.; University of Nebraska, Omaha, 1893; president of the board of education; captain in Medical Corps during the World War; aged 59; died, August 4, while on vacation in Boulder Junction, Wis.

Emil T. Tohulka, Glasford, Ill.; St. Louis College of Physicians and Surgeons, 1906; aged 57; died suddenly, July 26.